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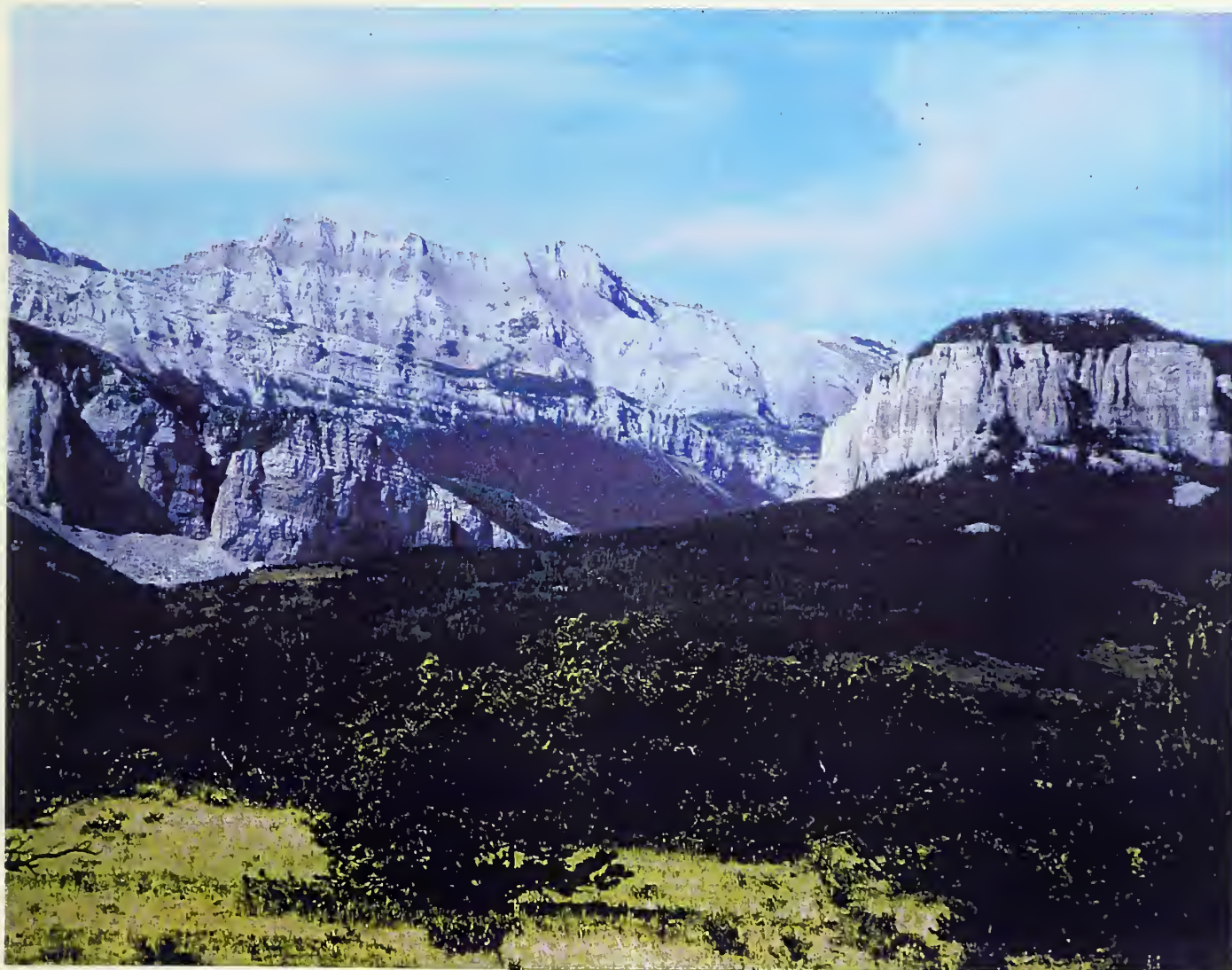
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ENVIRONMENTAL IMPACT STATEMENT

FOR THE PROPOSED

ROCKY MOUNTAIN FRONT MINERAL WITHDRAWAL



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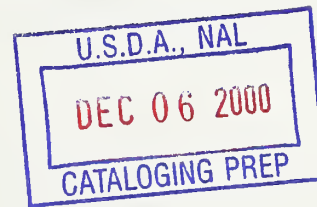


Cover photo: Muddy Creek Drainage

FINAL

**ENVIRONMENTAL IMPACT STATEMENT
FOR THE
ROCKY MOUNTAIN FRONT
MINERAL WITHDRAWAL**

August 2000



Prepared By

Lewis and Clark National Forest
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U.S. Department of Agriculture
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August 2000

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Date

ROCKY MOUNTAIN FRONT MINERAL WITHDRAWAL FINAL ENVIRONMENTAL IMPACT STATEMENT

ABSTRACT

Lead Agency: Forest Service, U.S. Department of Agriculture

Proposed Action: To withdraw from mineral entry federal hardrock minerals on 420,000 acres near Choteau, Augusta, and Lincoln in Teton, Pondera, and Lewis and Clark Counties, Montana. The withdrawal would be subject to review after 20 years.

Abstract: This EIS analyses the environmental consequences of two alternatives, i.e. the proposed mineral withdrawal and no mineral withdrawal (No Action). The proposed withdrawal of federal hardrock minerals would not allow new mining claims to be filed on federal lands. Private lands would not be affected. There would be no effect to unpatented mining claims, since none exist within the study area. The Lewis and Clark and Helena National Forest Plans would be amended to be consistent with the terms and conditions of a mineral withdrawal.

Under the "No Action" alternative, federal lands would not be withdrawn from mineral location and entry, i.e. federal lands would remain open and available for mineral location and entry under the mining law. This alternative would continue the management that existed prior to February 3, 1999 when the study area was closed to locating new mining claims for a two-year study period known as segregation. The Lewis and Clark and Helena National Forest Plans would be not amended regarding mineral location, entry, or recreational mining.

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ACRONYMS AND CHEMICAL SYMBOLS

Ag	Silver
ATV	All Terrain Vehicle
BA	Biological Assessment
BE	Biological Evaluation
BI	Beneficial Impact
BMPs	Best Management Practices
BMU	Bear Management Units
BMWC	Bob Marshal Wilderness Complex
BHP	Broken Hill Proprietary
BMPs	Best Management Practices
CDNST	Continental Divide National Scenic Trail
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CRATS	Cultural Resource Automated Tracking System
Cu	Copper
DEIS	Draft Environmental Impact Statement
EIS	Environmental Impact Statement
EO	Executive Order
FEIS	Final Environmental Impact Statement
FLPMA	Federal Land Policy Management Act
FOOGLRA	Federal Onshore Oil and Gas Leasing Reform Act
FR	Federal Register
FS	Forest Service
FSM	Forest Service Manual
HNFP	Helena National Forest Plan
ICSG	International Copper Study Group
ID	Interdisciplinary
ITA	International Trade Administration
IWWR	Inland West Watershed Reconnaissance
LCNFP	Lewis and Clark National Forest Plan
LME	London Metal Exchange
MFWP	Montana Fish, Wildlife and Parks
MIIH	May Impact Individuals or Habitat
MPDES	Montana Pollution Discharge Elimination System
MDEQ	Montana Department of Environmental Quality
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NI	No Impact
NRHP	National Register of Historic Places
OGC	Office of General Council
OHV	Off Highway Vehicle
P	Primitive
Pb	Lead
PCPI	Per Capita Personal Income
PSD	Prevention of Significant Deterioration
RARE	Roadless Area Review and Evaluation
RN	Roaded Natural
RNAs	Research Natural Areas
ROS	Recreational Opportunity Spectrum
RPA	Resource Planning Act

RS	Ranger Station
RV	Recreation Vehicle
RVDs	Recreational Visitor Days
SILs	Scenic Integrity Levels
SMS	Scenery Management System
SPM	Semi Primitive Motorized
SPNM	Semi Primitive Non-motorized
TES	Threatened, Endangered and Sensitive Species
TCPs	Traditional Cultural Properties
TDS	Totally Dissolved Solids
TMDL	Total Maximum Daily Load
TPI	Total Personal Income
UPS	Uninterruptible Power System
USC	U.S. Code
USDA	U.S. Department of Agriculture
USDI-BLM	U.S. Department of Interior – Bureau of Land Management
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VQOs	Visual Quality Objectives
WIFV	Will Impact Individuals or Habitat
WQLS	Water Quality Limited Stream
Zn	Zinc

CHAPTER 1

PURPOSE AND NEED FOR ACTION

SUBSTANTIVE CHANGES BETWEEN THE DRAFT EIS AND THE FINAL EIS

Under General Location and Geographic Setting:

The acreage for the mineral withdrawal has been adjusted to more accurately reflect the area proposed for withdrawal. The original figure of 429,000 acres was based on an estimate from the legal description published in the Federal Register. The new figure of 420,000 acres represents acreage calculated from digital land status maps provided by the Montana state Library (NRIS 1996). This area (420,000 acres) is the total acreage within the study area. The lands already withdrawn and private lands total 15,360 acres and are subtracted from the total acreage. This brings the acreage proposed for withdrawal to approximately 405,000 acres. These new figures will be used throughout the document.

Under Proposed Action:

A sentence was changed to indicate the proposed action was to withdraw the area from locatable hardrock mineral entry under the 1872 Mining Law, as amended.

Under Purpose and Need:

Canada lynx has been added to the list of Threatened and Endangered species.

Under Conformance with Laws, Policy and Regulations:

A section titled Cooperating Agency was added to reflect the Bureau of Land Management's cooperating agency status.

INTRODUCTION

This Environmental Impact Statement (EIS) discloses the potential environmental consequences of withdrawing National Forest System Lands along the Rocky Mountain Front, Montana from locatable hardrock mineral entry.

The USDA Forest Service (FS) is the agency responsible for preparing the EIS. The Secretary of the Interior will use the information in the EIS as the basis for a decision on future management of the federal mineral resource. The analysis in this EIS complies with provisions of the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations, Federal Land Policy and Management Act of 1976 (FLPMA) and the National Forest Management Act of 1976 (NFMA).

BACKGROUND

On February 3, 1999, Forest Service Chief Mike Dombeck announced a two-year moratorium on new mining claims on the Rocky Mountain Front and proposed to withdraw the area from mineral entry for 20 years. The two-year period provides time for the U.S. Forest Service to complete an environmental study of a longer-term mineral "withdrawal." With the publication of a Federal Register notice on February 3, 1999 (Appendix A), the two-year moratorium on new mining claims (known as a segregation) went into effect. Unless the Secretary of the Interior approves a mineral withdrawal by February 2, 2001, federal lands within the area will reopen to filing of new mining claims.

The General Mining Law of 1872 is the basis for appropriation of hardrock mineral resources from public lands. The Mining Law states: "All public lands that are not specifically excluded from availability, are open and available for mineral exploration and development." A mineral withdrawal prevents filing of new mining claims on Federal lands under the General Mining Law of 1872. It closes an area to mineral location (staking mining claims) and development. It does not affect private property or valid existing claims. Withdrawals are implemented to limit mineral-related activities in order to maintain other resource values in the area (43 Code of Federal Regulations (CFR) 2310).

GENERAL LOCATION AND GEOGRAPHIC SETTING

The proposed mineral withdrawal area (study area) is located in the Lewis & Clark and Helena National Forests along the Rocky Mountain Front in Montana, Map 1-1. Glacier National Park is directly north of the study area. The Great Bear, Bob Marshall and Scapegoat Wildernesses border the area on the west. National Forest boundaries form the eastern and southern edge of the withdrawal area. The Blackfeet Indian Reservation is adjacent to the northeastern boundary.

The tributaries of two nationally known rivers are within the withdrawal area. The streams and rivers east of the continental divide flow into the Missouri River. West of the continental divide, the withdrawal area drains into the Blackfoot River.

The study area consists of approximately 420,000 acres of both private and federal lands. Of this, about 415,000 acres are National Forest lands. Scattered throughout the area are about 5,000 acres of private land. Before February 3, 1999, 104 unpatented mining claims were being maintained in the area. These claims were dropped in September 1999. About 10,360 acres of federal land is currently withdrawn from mineral entry to protect administrative sites, campgrounds and reclamation projects in the area. Adjacent to the study area, the Great Bear, Scapegoat and Bob Marshall Wildernesses are also withdrawn from mineral location.

PROPOSED ACTION

The U.S. Department of Agriculture, Forest Service proposes to withdraw from locatable hardrock mineral entry under the 1872 Mining Law, as amended, National Forest System Lands along the Rocky Mountain Front, near Choteau, Augusta, and Lincoln Montana, Map 1-1. The proposed mineral withdrawal is 405,000 acres of federal lands, subject to valid existing rights. The withdrawal would be applied on 405,000 acres of currently unclaimed federal land, which would be withdrawn for up to 20 years. In accordance with federal regulations, the mineral withdrawal would be subject to review at the end of 20 years.

PURPOSE AND NEED

The primary purpose of the proposed mineral withdrawal is to preclude future potential impacts to resources from exploration or mining activities in the area. The Rocky Mountain Front has many unique and valuable resources, which could be degraded by mineral related activities. Resources of particular concern are:

- **Traditional cultural uses by Native Americans.** Traditional cultural uses within the study area include religious ceremonies and gathering of traditional herbs.
- **Threatened and endangered species.** The study area provides habitat for several threatened and endangered species including grizzly bear, gray wolf, bald eagle, Canada lynx and bull trout.
- **Outstanding scenic values and roadless character.** Many people believe the scenic qualities of the study area are among the best in the nation.

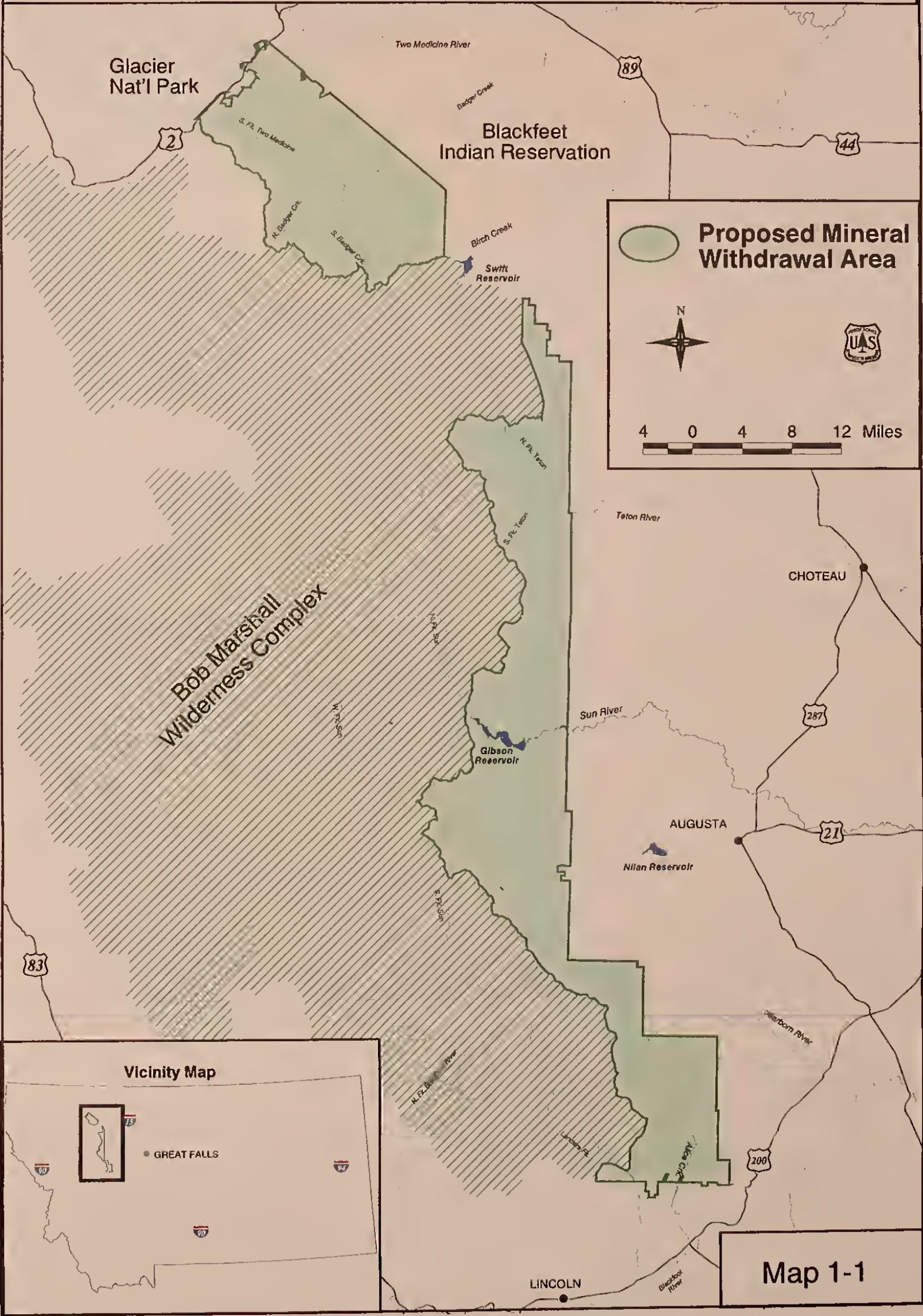
SCOPE OF THE ANALYSIS

This EIS discloses the potential environmental consequences of two alternative strategies for management of federal mineral resources, No Action (no withdrawal) and the Proposed Action (withdrawal). Several additional alternatives were identified during public involvement and were considered but not studied in detail in the EIS. Chapter 2, Alternatives, describes why the additional alternatives were not analyzed in detail.

The mineral withdrawal analysis focuses on a *policy level decision* concerning the appropriateness of future mining on federal lands in the area. This broader look at the area differs from a mine proposal analysis. A mine proposal analysis focuses on alternatives and mitigation designed to resolve resource issues and mitigate the effects of mining. Table 1-1, Nature of the Analysis, contrasts these two types of analysis.

Along with potential direct and indirect effects, the effects of past, present and reasonably foreseeable future actions are also described in this document. Effects of past and present activities in the area are discussed in the Affected Environment sections of

Proposed Rocky Mountain Front
Mineral Withdrawal
Lewis and Clark and Helena National Forests



the resource discussions in Chapter 3. Cumulative effects resulting from reasonably foreseeable activities are also summarized for each alternative.

In accordance with NEPA, a preferred alternative is identified as part of this EIS.

TABLE 1-1: NATURE OF THE ANALYSIS

Mineral Withdrawal (Policy Level Decision)	Mining Project (Site Specific Project)
Effects are largely based on assumptions about future mineral activities.	Effects are based on site-specific plans
Effects are described on an area level.	Effects are site-specific and based on location of facilities.
Effects are less easily quantified; described in terms of change, risk, and trends.	Effects are more easily quantified or measured.

DECISIONS TO BE MADE

The U.S. Department of Agriculture, Forest Service has filed an application with the Department of Interior, Bureau of Land Management to withdraw 405,000 acres of National Forest System lands from locatable mineral entry under United States mining laws. The Forest Service will prepare an EIS. The Chief of the Forest Service will submit a case file and the EIS to the Montana State Director, Bureau of Land Management, who will then submit a recommendation to the director of the Bureau of Land Management. The recommendation and supporting documentation will then be forwarded to the Secretary of the Interior for a decision. If the Secretary of the Interior decides to withdraw the area, the Chief of the Forest Service must issue a decision concurring with the Secretary of the Interior and amending the Lewis & Clark and Helena National Forest plans to reflect the change in management of locatable hardrock minerals. The Chief's decision, to concur with the withdrawal and amend the Forest Plans, will be contingent on the Secretary of the Interior's withdrawal decision.

The authority to withdraw lands from mineral entry lies with the Secretary of the Interior; however, no

withdrawal can take place on USDA Forest Service lands without USDA issuing a decision of concurrence. The Secretary of the Interior will decide which lands, if any, to withdraw, and for how long. If the Secretary chooses to implement a withdrawal and USDA concurs, the withdrawal would become effective on the date the Public Land Order is published in the *Federal Register*. The Secretary is limited to a maximum withdrawal period of 20 years (FLPMA 204 (c)(1)). At the end of the 20-year period, the withdrawal decision could be reviewed to determine if it is appropriate to extend it.

The Secretary of the Interior will advise Congress of the withdrawal action being taken, if a withdrawal of over 5,000 acres is approved. Congressional action is not required to implement the withdrawal. Congress can terminate the withdrawal by passing a concurrent resolution in the House and Senate within 90 days of the approval of the Public Land Order.

Decisions Beyond the Scope of this Analysis

The proposed mineral withdrawal does not apply to private lands, valid existing rights; leasable minerals (e.g., oil, gas, coal, geothermal); saleable minerals (sand and gravel); rights-of-way; or any other authorized surface uses on lands under the administration of the Lewis & Clark and Helena National Forests. Decisions regarding future mining on private land or unpatented mining claims with valid existing rights are beyond the scope of this analysis. Such decisions are subject to appropriate state and federal regulations and a separate environmental review process. Other non-mineral related land uses such as logging, hunting, vehicle use, and recreation would not be affected by the withdrawal.

The withdrawal does not apply to fluid minerals such as oil and gas. The Lewis and Clark National Forest have completed the Lewis & Clark National Forest Oil and Gas Leasing EIS (USDA Forest Service, 1997). The Lewis & Clark National Forest portion of the study area is not available for leasing. The Helena National Forest completed their Oil and Gas Leasing EIS in 1998 (USDA Forest Service, 1998). The portions of the Helena National Forest included in the mineral withdrawal are available for leasing with a "No Surface Occupancy" stipulation.

Designation of the area as Wilderness, National Park or National Recreation Area is beyond the scope of this analysis. Such designations require Congressional action.

Travel management decisions on road, trail and area motorized use within the study area are beyond the scope of this analysis. Such decisions are made at the District or Forest level using appropriate public involvement and environmental documentation (NEPA). For information on travel management for the area, see the Forest Visitor Maps for the Lewis & Clark and Helena National Forests.

CONFORMANCE WITH LAWS, POLICIES AND REGULATIONS

The mineral withdrawal EIS is guided by pertinent laws including the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality (CEQ) regulations, the Federal Land Policy and Management Act of 1967 (FLPMA), the National Forest Management Act of 1976 (NFMA), and General Withdrawal Procedure regulations at 43 CFR 2310.

Existing Laws and Regulations - The key laws and regulations applying to mineral development on federal land are summarized in Appendix B.

During the segregation and comment periods, people stated that existing laws and regulations are adequate to protect the environment. The fact that proposed mining projects must comply with existing laws and regulations is an important consideration but not the only factor in a withdrawal decision. A mineral withdrawal decision is a policy decision on future land use in an area. The policy question being addressed here is: whether mining is an appropriate use of the federal lands along Rocky Mountain Front, given the other resource values present.

Cooperating Agency - The Bureau of Land Management (BLM) was designated a cooperating agency in accordance with 43 CFR 2310.3-2(b)(3). The BLM has administrative authority over minerals and is responsible for review and recommendation

of the withdrawal package to the Secretary of the Interior. The BLM participated as a cooperating agency by providing review of the Draft and Final EIS.

Compliance with National Policy - Policies that address minerals management at the National level include the Forest Service Minerals Program Policy (8/3/85). The Forest Service Mineral Program policy states:

"The availability of mineral and energy resources within the National Forest and Grasslands significantly affects the development, economic growth, and defense of the nation. The mission of the Forest Service in relation to minerals management is to encourage, facilitate, and administer the orderly exploration, development, and production of mineral and energy resources on National Forest System Lands to help meet the present and future needs of the nation."

The mineral withdrawal, if approved by the Secretary of the Interior, is a change in management direction for specific lands within the study area. It does not reflect a change in National policy. The Forest Service Mineral Program Policy establish policies, goals and objectives applicable to the Nation as a whole but not necessarily for all lands with the National Forest System.

Wilderness Designation and Congressional Intent - Wilderness designation and mineral withdrawal are two separate and distinct actions with different intent and consequences. Wilderness is designated by Congress under the authority of the Wilderness Act of 1964 to preserve areas in a wild and primitive state. Mineral withdrawals are implemented at the discretion of the Administration or through Congressional action to withhold areas from mining in order to maintain other resource values present. Congressional action that resulted in establishing the nearby Bob Marshall, Scapegoat and Great Bear Wildernesses does not preclude or restrict administrative actions such as mineral withdrawal. Nor does a mineral withdrawal of non-wilderness lands result in a future wilderness designation by Congress.

CHAPTER 2

ALTERNATIVES

SUBSTANTIVE CHANGES BETWEEN THE DRAFT EIS AND THE FINAL EIS

The acreage for the mineral withdrawal has been adjusted to more accurately reflect the area proposed for withdrawal. The original figure of 429,000 acres was based on an estimate from the legal description published in the Federal Register. The new figure of 420,000 acres represents acreage calculated from digital land status maps provided by the Montana state Library (NRIS 1996). This area (420,000 acres) is the total acreage within the study area. The lands already withdrawn and private lands total 15,360 acres and are subtracted from the total acreage. This brings the acreage proposed for withdrawal to approximately 405,000 acres. These new figures will be used throughout the document.

Under alternative B, Proposed Mineral Withdrawal:

A sentence was added explaining the withdrawal can be reviewed by the Secretary of the Interior and extended for an additional twenty years.

INTRODUCTION

This chapter is the "heart" of the EIS (40 CFR 1502.14). It describes the two alternatives that are the basis of this environmental analysis. Under Alternative A, the "No Action" alternative, the Forest Service would not recommend withdrawing federal land within the study area from mineral location. Alternative B would recommend the proposed mineral withdrawal of approximately 405,000 acres of federal land.

The proposed action was formulated in response to an application to pursue a mineral withdrawal, which was approved by the Secretary of the Interior on January 29, 1999. Formulation of alternatives was also influenced by input from the public as well as from state and federal agencies during the

scoping period required by the National Environmental Policy Act of 1969 (NEPA).

Table 2-1 summarizes the status of the mineral estate for each alternative. This table is included to assist the reader in understanding how much land would remain available for potential future mining with each alternative. Also described in this chapter are the issues identified through public involvement.

Along with the alternative descriptions are the management actions and requirements common to both alternatives. This is followed by a summary of the environmental consequences presented in a comparative format to illustrate differences in effects between the alternatives. Identification of the agencies' preferred alternative is based on analysis of impacts in this document.

The last section describes other alternatives that were considered but eliminated from detailed study. This section includes a brief description of those alternatives and explains why they were not analyzed in detail.

ISSUES

Six issues were identified through internal scoping and public involvement. In Chapter 4, Consultation and Coordination, public involvement activities are discussed in detail. Each issue is summarized briefly in the following section. In accordance with NEPA regulations, these issues were used to focus the EIS.

Issues directly related to the proposal to withdraw the Rocky Mountain Front from mineral entry under the General Mining Laws include:

1. How does the proposed mineral withdrawal affect the availability of minerals in the study area?

The mineral resource potential of the project area will be discussed in the Forecast for Future Mineral Activity (Appendix C). This forecast is based on available knowledge of the area geology and known

TABLE 2-1: STATUS OF MINERAL ESTATE (acres approximate)

Land Status	Alternative A: No Mineral Withdrawal	Alternative B: Proposed Mineral Withdrawal
Federal Lands Subject to the Proposed Mineral Withdrawal	0	405,000
Federal Lands Available for Mining		
Unclaimed Lands	405,000	0
Existing Unpatented Mining Claims Subject to Valid Existing Claims	0	0
Total Federal Lands Available for Mining	405,000	0

mineral deposits. A mineral withdrawal would make any hardrock minerals in the study area unavailable for location and entry under the 1872 Mining Law.

2. What are the economic implications of the proposed mineral withdrawal?

This issue is addressed by the no action alternative. This alternative details the effects of not withdrawing the Rocky Mountain Front from mineral activity. The actions described in the no action alternative are based on the mineral activity forecast. This report details the mineral activities that may take place if the area is not withdrawn.

Other issues that deal with resource values found in the study area include:

3. What is the potential for the proposed mineral withdrawal to protect heritage resources in the study area?

There are 117 cultural resource sites recorded in the study area. The Rocky Mountain Ranger District has the highest site density per acre surveyed on the Lewis and Clark National Forest. Lands administered by the Rocky Mountain Ranger District have been determined to have the highest potential of containing traditional cultural properties on the Lewis and Clark National Forest. A portion of the Badger-Two Medicine is a

potentially eligible district of traditional cultural sites.

The Alice Creek drainage contains the Lewis and Clark National Historic Trail, also called "Cokahlarishkit" or "river of the road to the buffalo." Rock cairns suspected to mark the trail have been identified and recommended as eligible for listing in the National Register of Historic Places. The mineral withdrawal may help protect cultural resources from future mining-related disturbances.

4. What is the potential for the proposed mineral withdrawal to protect scenery and recreation values in the study area?

Many commenters referred to the scenic beauty of the Rocky Mountain Front. The study area is popular for sightseeing, hiking, horsepacking, backpacking, fishing, hunting, wildlife watching and skiing. Several major trails enter the Bob Marshall Wilderness Complex from the study area.

The potential effects of future mining on recreation opportunities and scenic integrity are a concern. The mineral withdrawal may help maintain the existing character, settings, recreation experiences and opportunities.

5. What is the potential for the proposed mineral withdrawal to protect wildlife resources in the study area, including threatened, endangered and sensitive species and their habitat?

The study area provides year-round habitat for the grizzly bear, a threatened species under the Endangered Species Act. Other threatened or endangered species that are present include the bald eagle, bull trout and gray wolf. The area also provides habitat for Canada lynx, wolverine, westslope cutthroat trout and northern goshawk. The mineral withdrawal may reduce future disturbance and habitat alteration related to minerals activities.

6. What is the potential for the proposed mineral withdrawal to protect the water resources in the study area?

Tributaries of two nationally known rivers, the Missouri and Blackfoot, flow from the study area. Alice Creek is considered a "special emphasis" watershed for the protection and recovery of bull trout. The majority of the watersheds in the study area are rated high in water quality integrity. The proposed mineral withdrawal could reduce the risks of mining-related effects to water quality and aquatic habitats.

ALTERNATIVES STUDIED IN DETAIL

The alternatives that will be analyzed in detail in the EIS are listed in this section. These are the "No Action" alternative (Alternative A) and the proposed action (Alternative B). There were no issues generated internally or through public scoping that lead to the development of additional alternatives. Therefore, we are only considering the proposed action and the No Action alternative.

Alternative A, No Mineral Withdrawal (No Action)

This alternative is referred to as the "No Action" Alternative because no action would be taken to withdraw the area from mineral location and entry. It would continue the federal minerals management that existed before February 3, 1999, when the

study area was closed to location of new mining claims for a two-year study period. Under this alternative, federal lands (approximately 405,000 acres) would remain available for mineral exploration and development under the General Mining Law of 1872. Mining claims could be staked for minerals considered "locatable" (e.g. gold, copper, silver, lead, zinc and platinum). These claims would give the claimant exclusive possessory rights to the federal mineral deposits subject to conditions under the General Mining Law of 1872 and other applicable statutes.

Exploration and mining on National Forest System Lands would be subject to the surface management regulations found in 36 CFR 228 Subpart A and other applicable state and federal laws. Surface occupancy and use under the mining laws would be limited to uses reasonably incident to the mining operations. Bonding would be required in accordance with Forest Service and State of Montana policies. All significant disturbances would require filing a plan of operations with the Forest Service and the Montana Department of Environmental Quality (MDEQ). Approval must be received before any significant surface disturbance takes place.

The Helena and Lewis & Clark National Forest Plans would not be amended regarding mineral location, mineral entry or recreational mining. This alternative provides a basis for comparing effects with Alternative B.

Alternative B, Proposed Mineral Withdrawal

Alternative B is the proposed mineral withdrawal. Under this alternative, no new claims for federal hardrock minerals could be located within the withdrawal area for twenty years. The withdrawal would be subject to review by the Secretary of the Interior at the end of the twenty-year period. The withdrawal may be extended for another twenty years if the Secretary determines that the purpose for which the withdrawal was made still exists.

Exploration and mining for locatable minerals would be prohibited on federal lands without valid existing rights. The proposed mineral withdrawal would not apply to private lands.

The Helena and Lewis & Clark National Forest Land and Resource Management Plans would be

amended to be consistent with the terms and conditions of a mineral withdrawal.

Management Common to All Alternatives

Mining-related activities on federal lands would be subject to existing surface management regulations described in 36 CFR 228 Subpart A, as well as other state and federal laws. The authorities and the general purpose for the various permits, licenses and approvals required for mining-related activities are summarized by agency in Appendix B.

Comparison of Alternatives

Table 2-2, Summary Comparison of Alternatives, contrasts the two alternatives, outlines the basis for analyzing environmental impacts, and displays other reasonably foreseeable activities.

Table 2-3, Comparative Summary of Impacts, compares alternatives by showing effects to area resources. It displays impacts for the issues discussed earlier in this chapter.

Table 2-4 documents the conclusion of effects for sensitive species. The effects of Alternative A – No Action and Alternative B – Proposed Action are disclosed in Chapter 3.

Preferred Alternative

Alternative B is the preferred alternative.

ALTERNATIVES ELIMINATED FROM DETAILED STUDY

The following alternatives were considered but not analyzed in detail for the reasons given below:

Extend the Period of the Proposed Withdrawal Beyond 20 Years.

This alternative was not analyzed in detail because the Federal Land Policy and Management Act of 1976 (Sec. 204 (c)(1)) limits the length of the withdrawal period. A withdrawal for a period longer than 20 years would require an act of Congress. Extending the withdrawal period is outside the administrative authority of the Forest Service and the Department of Interior.

Extend the Withdrawal Area to the South.

The National Forest lands south of the proposed withdrawal have already been modified by human activities. These activities include mines, roads and housing developments. The purpose of the mineral withdrawal is to preclude mining from sensitive areas that could be disturbed by mining. Since these areas have already been disturbed, withdrawing them would not meet the purpose and need. This decision does not preclude considering a larger area for mineral withdrawal in the future.

Exclude the Portion of the Helena National Forest from the Mineral Withdrawal.

A recommendation was made to exclude the Helena National Forest portion of the mineral withdrawal. This recommendation was made because the Alice Creek drainage is on a different forest and west of the continental divide. This area was included in the mineral withdrawal because it met the criteria in the purpose and need. It is similar culturally, biologically and visually to the rest of the withdrawal area. The Alice Creek drainage serves as an important wildlife corridor. It is also important from a cultural resources standpoint. The Lewis and Clark expedition used Lewis and Clark Pass. Indian tribes have also used it. The area was classified as roadless under the second Roadless Area Review and Evaluation (RARE II).

TABLE 2-2: SUMMARY COMPARISON OF ALTERNATIVES

Alternative A: No Mineral Withdrawal (No Action)	Alternative B: Proposed Mineral Withdrawal (Preferred Alternative)
<p>Approximately 405,000 acres of federal land would remain open for mineral location and entry subject to specific management guidelines and applicable law when the existing segregation period expires on February 3, 2001.</p>	<p>Approximately 405,000 acres of federal land would be withdrawn from hardrock mineral location and entry for a period of 20 years. The proposed mineral withdrawal would not apply to private lands.</p>
<p>Exploration and mining on federal lands would be subject to surface management regulations found in 36 CFR 228 Subpart A and other applicable state and federal laws. Bonding would be required.</p>	<p>Exploration and mining for locatable hardrock minerals would be prohibited on federal lands. No unpatented claims exist within the withdrawal area.</p>
<p>Forest plans would not be amended regarding mineral location or entry.</p>	<p>The Helena and Lewis & Clark Forest Plans would be amended to be consistent with the terms and conditions of the mineral withdrawal.</p>
Basis for Environmental Impact Analysis	
<p>Mineral development forecast includes:</p> <ul style="list-style-type: none"> ▪ Prospecting, claim staking, geochemical and geophysical surveying twice in 20 years ▪ Exploration drilling or trenching once in 20 years ▪ Probability of detailed drilling is very low ▪ No further development is anticipated 	<p>Mineral development forecast includes:</p> <ul style="list-style-type: none"> ▪ No prospecting, claim staking in 20 years ▪ No geochemical or geophysical surveying ▪ No exploration drilling or trenching in 20 years ▪ No detailed drilling ▪ No further development
<p>Other reasonably foreseeable independent activities include:</p> <ul style="list-style-type: none"> ▪ Recreation use will continue to increase; ▪ Lewis & Clark Bicentennial will dramatically increase recreation use through 2006 (at a minimum) and may necessitate site protection through recreation improvements in Alice Creek; ▪ Routine maintenance of trails, trailhead facilities and campgrounds will continue; ▪ Limited expansion of resorts and ski area will occur; ▪ Continued use by outfitters and guides; ▪ Existing roads will be maintained or improved; ▪ Limited timber harvest and timber stand improvement activities; ▪ Activities associated with existing oil and gas leases; ▪ Prescribed burns in and adjacent to the study area; ▪ Grazing will occur; and ▪ Riparian enhancement and range improvements activities will continue. 	

TABLE 2-3: COMPARATIVE SUMMARY OF IMPACTS

Alternative A: No Mineral Withdrawal (No Action)	Alternative B: Proposed Mineral Withdrawal (Preferred Alternative)
LAND USE	
Forecast of mineral activity assumes prospecting and claim staking, drilling and/or trenching may take place in the study area. The probability of mine development is very low. Mining-related effects are not anticipated to alter current and foreseeable land uses. Prospecting and exploration are expected to continue at historic rates.	Mining would not take place with proposed mineral withdrawal. There would be no impacts from mining-related activities on land use.
HERITAGE	
The consequence of forecasted activities on heritage resources would range from negligible to moderate. Mining-related effects could include damage or alteration to individual cultural sites. Increased use of the area or improved access to sites could also result in damage to sites.	Mining would not take place with proposed mineral withdrawal. There would be no impacts from mining-related activities on heritage.
WILDLIFE AND SENSITIVE PLANTS	
The consequence of forecasted activities on wildlife and sensitive plants would range from negligible to moderate. Mining-related effects could cause loss of habitat. Increased use of the area or improved access could also result in increased mortality and/or disturbance.	Mining would not take place with proposed mineral withdrawal. There would be no impacts from mining-related activities on wildlife or sensitive.
VISUAL (Scenery)	
The consequence of forecasted activities on visual resources would range from negligible to moderate. Mining-related effects could alter scenery. People may go to other areas to avoid increased activity.	Mining would not take place with proposed mineral withdrawal. There would be no impacts from mining-related activities on visual.
RECREATION	
The consequence of forecasted activities on recreation resources would range from negligible to moderate. Mining-related effects could change recreation settings and displace users from areas where they expect to travel or camp.	Mining would not take place with proposed mineral withdrawal. There would be no impacts from mining-related activities on recreation.
ROADLESS	
The consequence of forecasted activities on roadless areas would range from negligible to low. Mining-related effects could change roadless area characteristics. Natural integrity, remoteness, and opportunities for solitude could be altered.	Mining would not take place with proposed mineral withdrawal. There would be no impacts from mining-related activities on roadless.
ECONOMICS	
The consequence of forecasted activities on economic conditions would be negligible. Mining-related effects are not anticipated to affect local or regional economies.	Mining would not take place with proposed mineral withdrawal. There would be no impacts from mining-related activities on economic factors.

TABLE 2-3: COMPARATIVE SUMMARY OF IMPACTS (continued)

Alternative A: No Mineral Withdrawal (No Action)	Alternative B: Proposed Mineral Withdrawal (Preferred Alternative)
WATER RESOURCES AND FISHERIES	
The consequence of forecasted activities on water resources and fisheries would range from negligible to low. Mining-related effects could increase sedimentation rates, which could result in degradation of aquatic habitat.	Mining would not take place with proposed mineral withdrawal. There would be no impacts from mining-related activities on water resources or fisheries.
RESEARCH NATURAL AREAS	
The consequence of forecasted activities on research natural areas would be negligible. Mining-related effects are not anticipated to occur because areas could be withdrawn from entry via a separate analysis.	Mining would not take place with proposed mineral withdrawal. There would be no impacts from mining-related activities on research natural.
AIR QUALITY	
The consequence of forecasted activities on air quality would be negligible. Mining-related effects could locally increase the amount of dust and engine emissions.	Mining would not take place with proposed mineral withdrawal. There would be no impacts from mining-related activities on air quality.

TABLE 2-4: SENSITIVE SPECIES BIOLOGICAL EVALUATION SUMMARY OF EFFECTS

Species	Alternative A	Alternative B
Black-backed Woodpecker	MIIH	NI
Boreal Toad	MIIH	NI
Common Loon	MIIH	NI
Fisher	MIIH	NI
Harlequin Duck	MIIH	NI
Leopard Frog	MIIH	NI
Northern Bog Lemming	MIIH	NI
Northern Goshawk	MIIH	NI
Peregrine Falcon	MIIH	NI
Sensitive Plants ¹	MIIH	NI
Townsend's Big-eared Bat	MIIH	NI
Westslope Cutthroat Trout	MIIH	NI
Wolverine	MIIH	NI

NI No Impact

MIIH May impact individuals or habitat, but will not likely result in a trend toward Federal listing or reduced viability for the population or species.

WIFV* Will impact individuals or habitat with a consequence that the action may contribute toward Federal listing or result in reduced viability for the population or the species.

BI Beneficial Impact

*** Trigger for a significant action**

1 While the determination of effects for sensitive plants is MIIH, there is insufficient site-specific information to make a determination of effects on a species by species basis.

Date: January 28, 2000

Prepared by: /s/ David Whittekiend
Wildlife Biologist

CHAPTER 3

AFFECTED ENVIRONMENT AND EFFECTS ANALYSIS

SUBSTANTIVE CHANGES BETWEEN THE DRAFT EIS AND THE FINAL EIS

The Mineral Resource Potential section under Geological Resources / Minerals has been expanded. The terminology used in the discussion of undiscovered resources has been changed to reflect the probabilistic methods currently used by the U.S. Geological Survey (USGS) for mineral-resource assessments. The definition used in the draft EIS classified an area as having "low, moderate, high, unknown or no" potential (USGS Circular 831). The final EIS describes mineral potential in terms of "permissive tracts" and "favorable areas" (Box et. al. 1996). In addition to the stratabound copper-silver and lead-zinc deposit types addressed in the draft EIS, a brief discussion of the potential for two other hardrock mineral deposit types has been added. The porphyry copper and epithermal gold deposit types are associated with igneous intrusive and volcanic rocks which are found south of the withdrawal area and could occur at depth within the area. A more detailed description of mineral resource potential and mineral resource assessment methods is in Appendix C, Forecast for Mineral Activity.

INTRODUCTION

This chapter describes the resources and values that could be affected by the alternatives under consideration. Also described in this chapter are the environmental consequences that are anticipated from each alternative.

For each resource, the affected environment is described first. This is followed by a description of the anticipated environmental impacts of the two alternatives (Alternative A - No Mineral Withdrawal and Alternative B - Proposed Mineral Withdrawal). This organization is intended to enable the reader to easily understand the relationship between the affected environment and

the anticipated environmental impacts related to the resources.

Nature of Effects Analysis

This mineral withdrawal analysis focuses on a policy level decision concerning the appropriateness of future mining on federal lands in the area, considering other public values present. This broader look at the area differs from the "project level" analysis for a proposed mine. A project level analysis focuses on quantifying the effects on site-specific alternatives (see Table 1-1). An example of site-specific effects would be calculating the sediment generated from construction of two miles of road in the Wood Creek drainage based on soil type, grades, road design, etc.

Since a mineral withdrawal is a policy decision, it does not result in surface-disturbing activities. There are no direct effects on water, wildlife, and other biological and physical resources in the study area. The environmental effects of mineral withdrawal are based on assumptions about potential development that could occur as described in the Forecast for Mineral Activity, Table 3-1. Environmental effects tend to be expressed in terms that are more general, focus more on changing trends and are expressed more in terms of probable risks. Environmental effects based on forecasted activities are much less site specific and cannot be quantified as well as the impacts of a site specific proposal.

Forecast for Future Mineral Activity

A mineral activity forecast was developed to estimate future hardrock mining and exploration in the study area. The forecast presents the type and level of locatable mineral activity that may take place in the absence of a withdrawal. The forecast for future mineral activity is summarized in Table 3-1 and described in detail in Appendix C.

TABLE 3-1: FORECAST FOR FUTURE MINERAL ACTIVITY

Activity	Alternative A No Mineral Withdrawal	Alternative B Mineral Withdrawal
	Annual Likelihood*	Annual Likelihood*
Prospecting, claim staking, geochemical and geophysical surveying	1/10 years	0/20 years
Exploration drilling or trenching	1/20 years	0/20 years
Detailed drilling	< 1/1000 years	0/20 years
Further development	< 1/1400 years	0/20 years
* Number of occurrences of the specified activity in given number of years		

The forecast includes the type of potential mining activity and the relative probability of occurrence. Numerous factors such as quantity, grade, and location of known mineral reserves, the potential for other mineral occurrences in the area, land status, economics and mineral markets, mining technology and the mining and environmental laws and regulations were considered in developing the forecast. The forecast is speculative in nature and is not meant to imply that the listed activities would actually occur. The forecast serves as a basis for evaluating the potential effects of a withdrawal on mineral resources in the study area and it serves as a basis for assessing the potential effects of mining-related actions to area resources.

Analysis of Environmental Effects

The broad view analysis made effects disclosure more qualitative. The team used a risk analysis process to analyze and display effects.

The concept of risk embodies two components: The likelihood of an event occurring and the environmental consequences produced by the event should it occur. Expressed more simply:

$$\text{Risk} = (\text{likelihood}) \times (\text{consequences})$$

Each team member developed a table of consequences for their resource. Possible impacts to the resource were categorized from negligible to extreme. The likelihood of mineral activity was developed using the mineral activity forecast. Effects were determined by combining the likelihood of an event occurring and the consequences of that event.

Mining-Related Actions

The environmental effects sections include the term "mining-related actions". Mining-related actions include:

- Prospecting, Exploration – access, drilling, geophysical exploration, trenching, sample pits
- Development – drilling, constructing shafts and adits, access, power, communications, mine and millsite preparation
- Production – underground and surface methods, ore dressing, wastes, roads
- Reclamation

See Summary of Assumptions (Appendix D) for a more detailed discussion of these actions.

The probability for each type of mining related action occurring in the study area is discussed in the Forecast for Mineral Activity (Appendix C).

MINERALS AND LAND USE

This section provides a description of the current land uses, geology and mineral resources in the study area. Effects of the proposed mineral withdrawal on availability of minerals, private lands and unpatented mining claims are addressed here. Consistency with Forest Land and Resource Management Plans is also presented.

CURRENT LAND USES IN THE STUDY AREA

Recreation

A wide variety of year-round recreational activities occur on federal lands in or near the study area. The proximity to the Bob Marshall Wilderness Complex and Glacier National Park provides opportunities for wilderness recreational experiences near the area. The study area is used during the summer for camping, hiking and backpacking, fishing, picnicking, ATV, and other motorized activities. During the fall, the study area is used primarily for hunting. Snowmobiling and skiing take place during the winter.

Timber and Grazing

Recently, only small-scale timber harvesting has occurred. Removal of post and pole products and personal use firewood are primary uses of timber in the study area. Cattle and horse grazing occur throughout much of the study area.

Oil and Gas Leasing

Oil and Gas Leasing EISs have been completed for both of the Forests involved in the mineral withdrawal. The decision for the Lewis and Clark National Forest portion of the mineral withdrawal was to not lease those lands during the next planning period (10-15) years. This decision is now under litigation. The decision for the Helena National Forest portion was to lease the lands with a no surface occupancy stipulation. This would allow someone to lease subsurface minerals, but would preclude occupancy of the surface. Subsurface hydrocarbon resources could be accessed using directional drilling techniques from adjacent areas on which occupancy was allowed. Several leases are still valid in the study area. In addition, drilling proposals have been submitted on several existing leases. These include proposed well sites in the Goat Mountain and Hall Creek areas on the Lewis and Clark Forest. Leases on the Lewis and Clark Forest are currently in suspension. Litigation on the Hall Creek proposal is pending and no decision has yet been made on the Goat Mountain proposal.

Research Natural Areas

Two research natural areas (RNA) are located within the study area. The Indian Meadows RNA is on the Helena National Forest and the Wagner Basin RNA is on the Lewis & Clark Forest. These areas were set aside for use in non-manipulative research as well as for baseline comparison and observation.

GEOLOGICAL RESOURCES/MINERALS

The area's varied geology created the dramatic landforms and influenced the drainage patterns, soils and vegetation of the Rocky Mountain Front, Alice Creek drainage and Indian Meadows area. In addition, the geology influences the potential for mineral occurrence and current land use within the study area. The study area is classified as having a low occurrence potential for precious and/or base metal mineral deposits.

Management Direction

Mining-related activities on federal lands are subject to surface management regulations described in 36 CFR 228 Subpart A and other state and federal laws. The authorities and the general purpose for the various permits, licenses and approvals required for mining-related activities are listed by agency in Appendix B. In addition, direction provided by the Helena and Lewis & Clark Forest Plans are discussed later in this section.

Affected Environment

General Geology

The mineral withdrawal covers the eastern edge of the Sawtooth Range and parts of the Lewis and Clark Range, an area described by geologists as the "overthrust belt". These north south trending ranges are comprised almost entirely of Paleozoic and Mesozoic sedimentary rocks (sandstones, mudstones, shales and limestones between 550 and 65 million years old). The rocks have been tightly thrust faulted. Compressive forces caused

layers of rock from the west to be broken into plates and shoved over their eastern counterparts. The result is repeating sequences of rock, much like a stack of fallen dominoes. The distinctive east facing limestone cliffs separated by gentle westward dipping backslopes give the Sawtooth Range its name. The jagged limestone peaks, steep walled valleys and cirque basins are the result of Pleistocene alpine glaciation. On the southern end of the study area, the landscape character changes with the geology. The four major, gently westward dipping thrust plates of Precambrian and Paleozoic sedimentary rocks that shape the southern Lewis and Clark Range replace the tightly imbricated Paleozoic and Mesozoic sediments of the Sawtooth Range (Whipple et al. 1987). *Refer to the photos taken from viewpoints 2 and 3 in the discussion on Scenery resources.*

Mineral Resource Potential

Mineral resource potential is the likelihood for the existence of undiscovered mineral resources in a defined area. Mineral resource potential is largely dependant on whether the geologic, geochemical and geophysical characteristics indicate a favorable geologic environment.

Mineral-resource assessments by the U.S. Geological Survey (USGS) are the primary source of mineral-resource information available to the Forest Service. Mineral-resource assessments include: inventories of the past production and remaining resources of known mineral deposits, mapped areas where the geology permits mineral deposits of a given type, and estimates of the numbers of undiscovered deposits of each type (Box et. al. 1996).

These estimates of undiscovered deposits, in conjunction with the appropriate grade and tonnage information generated as part of a particular mineral deposit model (a conceptual aggregate of similar mineral deposits) provide the basis for forecasts of base and precious metal mineralization in the area.

The USGS (Box et. al.1996) defines a 3-step method to assess the mineral-resource potential of an area. In the first step, relevant geologic information and mineral deposit models are used to "outline areas whose geologic characteristics allow the possibility of the presence of specific

mineral deposit types" (Ibid, p.12). The USGS refers to these areas as "permissive tracts." They "outline an area where the occurrence of a given deposit type cannot be excluded using regional geologic considerations" (Ibid). In the second step, a team of experts makes an estimate of the number of undiscovered mineral deposits of each type expected in a tract permissive for that deposit type. The third step of the assessment procedure is to "combine the estimates of the types and numbers of deposits with the grade and tonnage models in a numerical simulation to produce a probability distribution of the quantities of contained metal in undiscovered deposits"(Ibid). In addition to permissive tracts, the USGS delineates "favorable areas" which represent their "best estimate of where mineral exploration and development are most likely to occur in the next ten to twenty years" (Ibid, p.13). Favorable areas are based on factors such as the presence and clustering of prospects of the appropriate deposit type, known exploration activity, and geologic and geochemical evidence.

Within the proposed withdrawal area, the USGS has delineated permissive tracts and favorable areas for two stratabound metallic mineral deposit types (Earhart et. al. 1981, Tysdal, et. al. 1996, Box et. al. 1996). A stratabound deposit is one in which the mineralization occurs in lenses or layers parallel to the bedding or stratification of the enclosing rock. In the withdrawal area, both the sediment-hosted copper (Cox, 1986 Model 30b) and the sandstone-hosted lead-zinc (Cox, 1986, Model 30a) deposit types are associated with Proterozoic metasedimentary rocks in the Belt series. The models for these two deposit types are summarized in Appendix C.

The sediment-hosted copper deposits are disseminated copper and silver sulfide minerals in quartzites and argillites. Anomalous amounts of copper occur in green (reduced) beds in all Belt Series rocks except the Bonner Quartzite (Earhart et al. 1981, Zientek, 1996). Map 3-1 shows the extent of the Belt series metasediments, as well as the areas in which the geologic environment and mineral occurrences are considered favorable for sediment-hosted copper deposits. Sampling of the mineralized zones in these "green-bed" deposits shows average copper values of between .1% - 1.5% and silver values between .25 - .32 oz/ton (Earhart et. al. 1981). The mineralized zones were small and discontinuous. No estimate of volume of mineralized rock has been given. In the Alice Creek area, copper sulfide minerals

occur as disseminated deposits and fracture fillings in light-gray quartzites and siltite lenses in the Spokane Formation. Earhart and others (1981) estimate a minimum of 800,000 tons of mineralized rock, which averages 0.1% copper and 0.2 oz. silver per ton. Table C- 1 outlines the tonnage and grades normally associated with the sediment-hosted copper model.

The sandstone-hosted lead-zinc deposit type consists of lead and zinc (locally containing copper and silver) in calcareous quartzites in the lower part of the predominantly carbonate Helena Formation. Map 3-2 shows permissive tracts for sandstone hosted lead-zinc deposits. Samples of the mineralized rocks contained generally less than 1% combined lead and zinc (Earhart, et. al., 1981).

Subsurface mineral occurrences of both deposit types (sediment-hosted copper and sandstone-hosted lead-zinc) are probable and the extent of Proterozoic rocks shown in maps 3-1 and 3-2 outlines a permissive tract for these deposits.

Southeast of the study area copper has been mined from Eocene age porphyritic monzonites of the Mike Horse Stock in the Heddleston District. Dikes and small stocks of monzonite and quartz monzonite porphyry crop out along a roughly west-northwest trend toward Red Mountain west of Indian Meadows. Based on this outcrop trace combined with geochemical and geophysical data (Leinz and Grimes, 1980a, 1980b), Earhart and others (1981) speculate that porphyry copper deposits may occur at depth in the southern end of the withdrawal area. A similar combination of geochemical and geophysical evidence collected between Gibson Reservoir and Deep Creek led Earhart and others (1981) to speculate the presence of a "buried molybdenum-bearing porphyry deposit, although no intrusives, veins, or hydrothermal alteration features are exposed" (Earhart et. al. 1981).

In the Indian Meadows RNA (southwest corner of the withdrawal area) the USGS outlines permissive tracts for quartz adularia and hot spring gold-silver deposits related to the Lincoln volcanics to the south (Luddington et. al. 1996). Two significant epithermal vein type deposits occur in the nearby Seven-Up Pete district: the Seven-Up Pete quartz adularia vein deposit and the McDonald Meadows disseminated hot spring gold -silver deposit (Frishman, 1996). Tuff associated with the volcanics of Crater Mountain is

mapped near the withdrawal area boundary (Whipple et. al. 1987). No gold or gold-silver deposits have been reported anywhere in the withdrawal area.

Mineral deposit types within the study area and their resource potential are more fully described in Appendix C.

Mineral Demand

Mineral demand plays a role in determining whether economic conditions are such that industry would be interested in exploring for, or developing, mineral resources, if present.

Lead, zinc, copper, and silver are the commodities of potential interest to the mining industry in the study area (see Appendix I). Current Market conditions are marginally favorable for lead and zinc, which commonly occur in the same deposit, and could result in some industry interest for exploration and development. Low market price offers little financial incentive to explore for copper. This, coupled with stock surpluses and mine closures, translates in a low probability that copper will be prime target of company exploration. Recent futures market transactions show that silver prices are projected to rise slowly over the next 6-8 months and there is likely to be some interest in exploring for deposits where silver is the primary commodity. Silver deposits requiring large revenue contribution from associated copper to be economic will tend to be ignored.

Mineral Activity

Identifying where and what type of past mineral activity has taken place can serve as an indicator of the amount, type and frequency of mineral activity we might project in the future. Only a few areas in the proposed withdrawal area have had any mineral interest. These are discussed below and locations are shown on Map 3-3.

Alice Creek Area

Stratabound copper-silver occurrences have been discovered in the Alice Creek area on the Helena National Forest. The USGS estimates a minimum of 800,000 tons of mineralized quartzites are exposed on the surface and continue to a shallow depth (Earhart et al. 1981).

A small pod-shaped deposit, of approximately 200 tons, containing silver ore was mined at the Bear Gulch Mine. Although no production values are known for the Bear Gulch Mine, also called the Adele or Alyce Creek, it has been the target of repeated exploration efforts, which started with the Bear Creek Mining Company in the early 1960's. Exploration efforts by Noranda Exploration continued into the early 1990's. North of Cadotte Pass, and just adjacent to the National Forest boundary, the Copper Bowl mine experienced some exploration efforts. No records indicating mineral production are known (Earhart et al. 1981).

Elk Creek Area

Early settler George White excavated shafts and prospect pits in the Elk Creek Ranch area (Holcombe 1963). Claims were staked in Lead Gulch in 1970, more prospect pits and a small adit were excavated. No production of any minerals has been recorded and the claims were abandoned by 1978.

Gibson Reservoir (Lange Creek)

The Mountain Chief and Chief of the Mountain claims were patented in 1910 based on mineral seeps found in the area. These seeps deposited a layer of melanterite, or hydrous ferrous sulfate, which was scraped off the rock and used for medicinal purposes (Fullbright 1996).

Wood Creek Area

The Duval Corporation's Big Banana project involved some 80 claims staked along Wood Creek Hogback in 1974. Exploration targets were likely lead and zinc deposits. Exploration consisted of constructing about three miles of road and drilling three core holes in the roadbed. The project and claims were abandoned in 1976.

Muddy Creek Area

Mark Alldredge staked 104 claims covering close to 2000 acres of Paleozoic sedimentary rocks in the Muddy Creek drainage in 1996. Exploration efforts, consisting of soil sampling and geophysical surveying using handheld equipment, occurred through 1997. The claims were dropped in September of 1999. The area has had no previously recognized mineral potential and the claimant declined to provide information on

exploration targets. Rumor of diamonds surfaced following the discovery of diamonds in the Hinton area of Alberta, Canada, but no evidence of similar geological setting or occurrences are known for this area.

Other Minerals

The proposed withdrawal would not affect mineral resources considered leasable or salable under Forest Service regulations. The likelihood of occurrence and development potential of these resource types are discussed here.

Limestone is abundant on the Rocky Mountain Front. Limestone can be used as a building stone and in cement production. The potential for development of a quarry or use of this material for cement manufacture in the study area is extremely low. Equally suitable or superior sources of limestone exist outside the study area, much closer to potential markets. Similarly, demand for sand and gravel from alluvial or glacial deposits in the study area are expected to remain very low because superior pit sites exist much closer to potential markets.

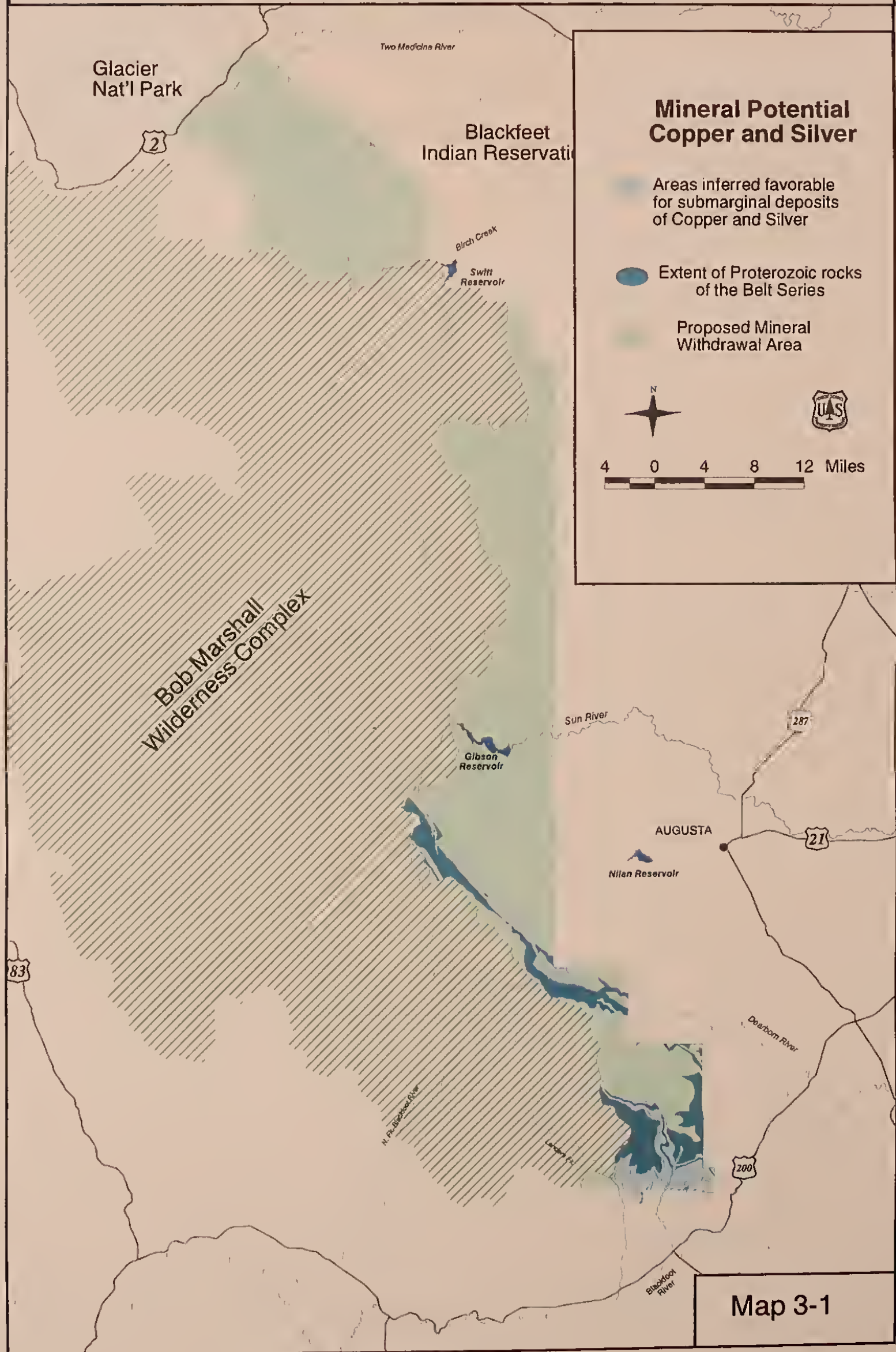
The Rocky Mountain Front is considered to have high occurrence potential for oil and gas resources. This is based on USGS designated oil and gas plays, producing gas fields, and the stratigraphic section (presence of source and reservoir rocks), and structural setting (presence of seals and traps) (Oil & Gas EIS, pg. B-27). The undiscovered resources are estimated to be in the range of 2.5 trillion cubic feet (Oil and Gas EIS, pg. B-45).

Environmental Effects

The direct impacts to geological resources from hardrock mineral development, under both alternatives, are based on the availability of federal lands for mineral exploration and development.

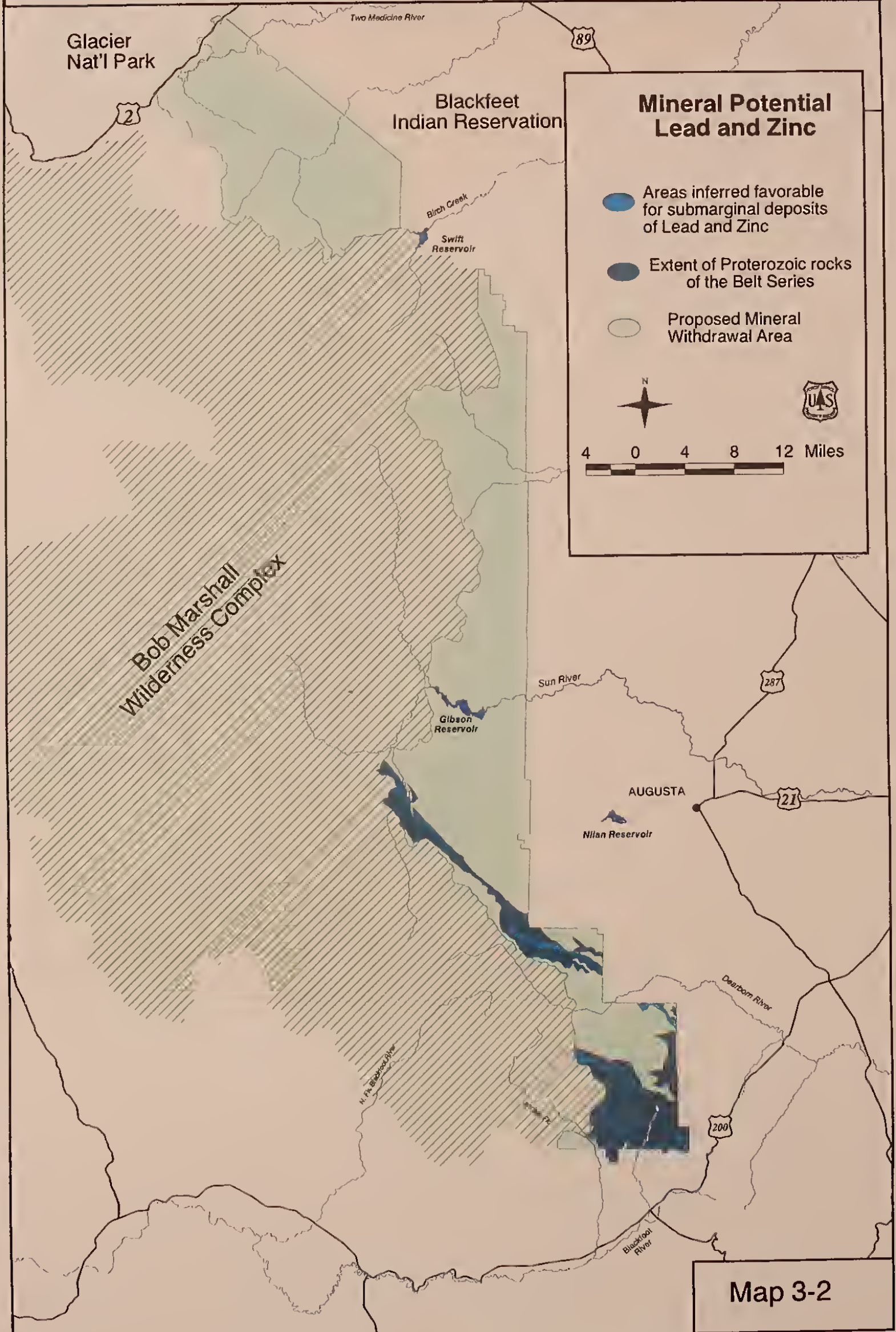
An issue raised in scoping was the effect a withdrawal would have on undiscovered mineral resources in the area. This issue is specifically addressed in the Forecast for Future Mineral

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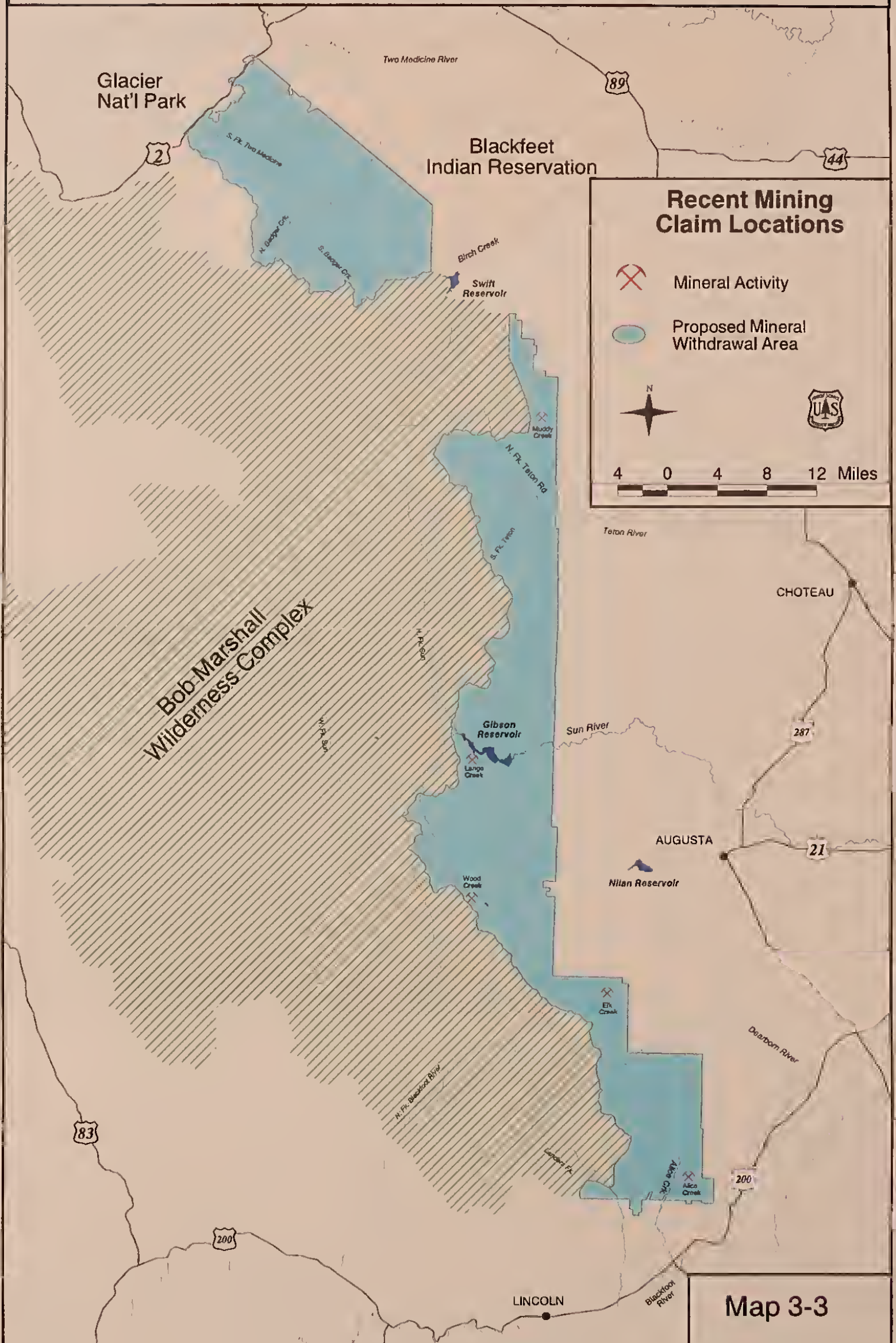
Map 3-1

Proposed Rocky Mountain Front
Mineral Withdrawal
Lewis and Clark and Helena National Forests



Map 3-2

Proposed Rocky Mountain Front
Mineral Withdrawal
Lewis and Clark and Helena National Forests



Map 3-3

Activity (Appendix C). The forecast estimates the probability of exploration and development of undiscovered resources based on the geologic setting, past levels of mineral activity and economic incentives for exploration in the minerals industry.

Undiscovered precious and base metals in the withdrawal area are most likely to be copper, silver, lead and zinc. Prospecting for more speculative exploration targets including gold, molybdenum and gemstones could occur, but detailed analysis of exploration spending and mine / mill investment based on mineral demand for these commodities is not included in the mineral activity forecast because ore mineralization associated with those deposit types has not been reported in the withdrawal area.

Effects of Alternative A

Under Alternative A, approximately 405,000 acres of federal land would remain available for mineral entry. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes that a geologic mapping and geochemical and geophysical surveying program would take place once every ten years.

Exploration by drilling is expected 5 times in 100 years. The probability of detailed drilling and development is much less (0.1%). These activities will not be covered in the effects discussion because their probability of occurrence is so low.

This alternative assumes the continued availability of all 405,000 acres in the study area for location and entry under the 1872 Mining Law. As projected in the minerals activity forecast, the most likely scenario for minerals-related activities would include geological mapping, limited claims staking, sampling, geochemical and geophysical activities. There is a smaller probability that this would lead to drilling or exploration through trenching and an extremely small chance of actual development or production.

Alternative A would retain the opportunity for evaluating undiscovered mineral resources should mineral economics or exploration targets change in the next 20 years.

Effects of Alternative B

Under Alternative B, approximately 405,000 acres of federal land would be closed to mineral entry.

No unpatented claims exist within the withdrawal area. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes no mines would be developed and no other exploration would take place.

This alternative would preclude opportunities for discovery of locatable mineral deposits throughout the study area and would preclude mining on the Rocky Mountain Front for the next twenty years.

PRIVATE LANDS AND UNPATENTED MINING CLAIMS

Affected Environment

There are approximately 5000 acres of private land/private mineral rights within the study area. There are no unpatented mining claims within the proposed withdrawal area. A mineral withdrawal does not affect mineral development of privately owned mineral rights or federal land with unpatented mining claims subject to valid existing rights.

Environmental Effects

Effects of Alternative A

Under Alternative A, approximately 405,000 acres of federal land would remain available for mineral entry. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes that a geologic mapping and geochemical and geophysical surveying program would take place once every ten years. Exploration by drilling is expected 5 times in 100 years. The probability of detailed drilling and development is much less (0.1%). These activities will not be covered in the effects discussion because their probability of occurrence is so low.

Under Alternative A, 405,000 acres of federal land in the study area would remain available for mineral entry.

All federal land remains available for filing of mining claims. Current land management continues with all federal land in the area available for mineral entry with the exception of

approximately 1700 acres that are currently withdrawn around federal recreation and administrative sites.

Effects of Alternative B

Under Alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes no mines would be developed and no other exploration would take place.

Under Alternative B, 405,000 acres of federal land would be immediately subject to mineral withdrawal.

The immediate effect of a mineral withdrawal is to withhold from future mining 405,000 acres of unclaimed federal land. Mineral development could proceed on private land. The proposed mineral withdrawal could affect future development on private land if development depended on adjacent federal land for part of the operation.

There is no evidence that a mineral withdrawal would affect property values in the area.

FOREST PLAN CONSISTENCY

This EIS addresses the both Helena and Lewis & Clark Forest Plan mineral withdrawal criteria. A discussion of the withdrawal process, laws and regulations is included in Chapter 1. Appendix B summarizes pertinent laws and regulations, applicable to mining proposals, which are designed to protect the environment. The resource values of the area and potential risks are described in the Affected Environment sections of Chapter 3. The mineral potential of the area is discussed under Appendix C. In summary, information relevant to the Forest Plan criteria is presented throughout the EIS and will be considered in making a decision about the proposed mineral withdrawal.

Affected Environment

The Forest Plans for the Lewis & Clark and Helena National Forests direct management of federal lands within the study area. Forest Plans are required by the Forest and Rangeland Renewable Resource Planning Act of 1974 (RPA) as amended by the National Forest Management Act of 1976 (NFMA). They provide guidance for all natural resource management activities on National Forest System lands. Plans establish goals and objectives for the multiple uses of renewable resources, and standards and guidelines to assure sustained productivity of the land and protection of the environment. In short, goals and objectives identify the types of goods and services to be provided while standards and guidelines set the environmental sideboards within which activities are to be carried out.

Forest Plan direction is established at two scales. Forest-wide direction is applicable throughout the Forest, while management area direction ties specific goals, objectives, and standards to the unique capabilities of given parcels of land.

Lewis & Clark Forest Plan: Forest-wide Direction

Forest-wide direction for the Lewis & Clark National Forest can be found in Chapter 2 of the Lewis & Clark National Forest Plan (LCNFP). The Plan's goals and objectives reflect the types of goods and services to be provided from the forest as a whole. All goals and objectives are not meant to be pursued on every acre or within each watershed on the forest.

Among the 10 long-range goals of the Lewis & Clark Forest is one that states, "Facilitate exploration and development of the mineral resources while protecting other resources through mitigating stipulations (LCNFP, pg. 2-2). This goal is complemented in the section describing forest-wide objectives (LCNFP, pg. 2-7) with a statement that "Mineral access, exploration, and development activities will be accomplished in a manner consistent with plan requirements for management of other resources and uses". It also states: "Activities authorized under the mining laws will be administered under the appropriate regulations and according to the Forest Plan".

Although the Rocky Mountain Division is recognized in the Forest Plan as having high potential for oil and gas, the Forest Plan does not recognize a hardrock mineral potential in the area.

Forest-wide standards are designed to limit the magnitude and scope of activities in order to maintain and protect certain conditions of the land. Since mineral withdrawal does not result in the implementation of any ground disturbing activity, compliance with any of the Forest-wide standards would not be a problem.

Forest Plan management standard G-3 (LCNFP, pg. 2-59) gives management direction for evaluating existing and proposed mineral withdrawals. This direction is as follows:

(a) Is the land still being used for the purpose for which it was withdrawn?

This question does not apply, as the area is not withdrawn.

(b) Are there other ways available to protect the resource values (for instance, existing statutes and regulations, rights-of-way, cooperative agreements)?

Forest Service surface management regulations at 36 CFR 228 Subpart A and various federal statutes such as the Clean Water Act, NEPA, Endangered Species Act, National Historic Preservation Act, etc. provide a means of insuring that effects from mining operations on National Forest System Lands are minimized and mitigated.

The Forest Service has the authority to reduce risks to resources by insuring that effects from mining activities are mitigated to levels that meet standards in Federal laws and regulations. However, the Forest Service under its current authority cannot prohibit, or so unreasonably limit as to amount to a prohibition, activities that are reasonably necessary for a mining operation. By statute, an operator is allowed use of the surface reasonably necessary for or incident to mining, provided the proposed activities meet Federal and State standards.

While the Forest Service can reduce risk, mining activities cannot be eliminated under current authority. The fact that activities could occur, even though they are mitigated, means there is some level of risk of unexpected impacts to resources. The only way to eliminate risk is to withdraw the area. In addition, there is a risk that property

would be patented and leave federal ownership if valid existing rights are established under the mining law in areas that are not withdrawn from mineral entry. This would eliminate Forest Service regulatory authority over the lands involved, except for regulating access to any inholdings created.

The proposed resource value protection standard established by the Chief of the Forest Service for the Rocky Mountain Front is not to just reduce risks to resource values to extremely low levels, but to eliminate any risk from mining activities. The only way to achieve a "no risk" goal is withdraw the area.

(c) Are the values at risk of such a nature that a significant financial, social, or cultural loss could occur?

The values at risk in the area proposed for withdrawal are detailed in the Purpose and Need in Chapter 1 and in Chapter 3. These values include current traditional cultural use by Native Americans, use of the area by grizzly bear, gray wolf, bull trout and bald eagle, and outstanding scenery and roadless character.

The proposed withdrawal area has many sites that are important culturally. Approximately one-third of the Badger-Two Medicine area is a potentially eligible district of traditional cultural sites. The Lewis and Clark National Historic Trail, also known as the "Cokahlarishkit" or "river of the road to the buffalo", is located in the Alice Creek drainage. American Indians and early explorers, including the Lewis and Clark expedition, used this ancient travel route to cross the Continental Divide.

The area is home to the last population of plains grizzly bears in North America. These bears still journey onto the plains to spend the summer, like the grizzly bears encountered by the Lewis and Clark expedition. Gray wolves have naturally colonized the area, preying on the large herds of elk, deer and bighorn sheep, whose populations have rebounded in the last 75 years. Bald eagles migrate through the area in the spring and fall, resting on their way to and from summer nesting territories in Canada.

The Rocky Mountain Front provides some of the most spectacular scenery in the state of Montana and in the National Forest System. The mountains rise out of the plains and can be seen from miles

around. Visitors and recreationists come from around the United States and the world to visit the Rocky Mountain Front. Much of the area proposed for withdrawal is within an inventoried roadless area and has been included in a variety of wilderness bills before Congress.

(d) Does the withdrawal area have a high mineral potential or are there nearby mining claims or mining activities?

At the time the withdrawal application was filed, there were 104 unpatented mining claims within the study area. These claims in the Blackleaf area were filed in 1996. Exploration efforts consisting of soil sampling and geophysical surveying were carried out through 1997. The claims were dropped in September 1999, after the segregation order. Other mineral related activities that have taken place within the study area are detailed in the Forecast for Future Mineral Activity (Appendix C).

Although the area does not have high mineral potential, mining activities have taken place and it is reasonable to assume that they would take place in the future. The Forecast for Future Mineral Activity (Appendix C) details the probability of certain mining activities taking place within the study area.

Lewis & Clark Forest Plan: Management Area Direction

Areas within the Lewis & Clark Forest that have had active or recently active mineral extraction, processing and/or exploration were assigned a management prescription of MA - L. The goal for this management area is: "Emphasize opportunities for mineral exploration, development, and production while protecting historical values". None of the study area is allocated to MA - L.

The Lewis & Clark's segment of the study area has ten management allocations (E, F, G, H, I, M, N, O, Q, R). The management areas for the Lewis and Clark Forest are shown in Map 3-4. Management direction for the areas is shown in Table 3-2.

Each management area's direction provides for other resource objectives as long as their uses are compatible with the primary management area goals. Specific management standards, in addition to the forest-wide standards, are described for all uses, including minerals. Refer to Chapter 3 of the

Lewis & Clark Forest Plan for a complete description of goals and directions for these management areas.

**TABLE 3-2: LEWIS AND CLARK
NATIONAL FOREST MANAGEMENT
AREA DIRECTION**

Lewis & Clark Management Areas	Management Direction
MA - E	Provide sustained high level of forage for livestock and big-game animals.
MA - F	Emphasize semi-primitive recreation opportunities, while maintaining and protecting other forest resources.
MA - G	Maintain and protect forest resources with minimal investment.
MA - H	Provide recreation opportunities supported by other public and private developments while maintaining other resource values
MA - I	Maintain or enhance important big-game habitat. Emphasize the management of Threatened & Endangered species habitat.
MA - N	Provide interim management as a Wilderness Study Area.
MA - M	Maintain natural conditions for Research Natural Area purposes.
MA - O	Protect, maintain, and improve resource quality while providing timber at a low intensity level to meet local needs. Manage for livestock at moderate intensity level.
MA - Q	Manage these areas to not preclude their inclusion in the National Wilderness Preservation System.
MA - R	Manage to protect or enhance unique ecosystem values associated with riparian zones.

Helena Forest Plan: Forest-wide Direction

Forest-wide direction for the Helena National Forest can be found in Chapter 2 of the Helena National Forest Plan (HNFP). The Helena Forest Plan describes goals in a manner similar to the Lewis & Clark Forest Plan. The goal related to minerals management (HNFP, pg. II/1) is: "Provide for exploration, development, and production of mineral and energy resources on the Forest."

Helena National Forest's objectives summarize how the various resources and activities will be managed under the Forest Plan. The objective for minerals (HNFP, pg. II/5) states, "Mineral access, exploration, and development will be consistent with Plan requirements for managing other resources and uses", and "Activities authorized under the mining laws will be administered under the appropriate regulations and according to the Plan."

Forest-wide standards (FP, pg. II/27) include: allowing access for development of locatable minerals on a case-by-case basis, continuing to encourage the responsible development of mineral resources, consistent with the Mining and Mineral Policy Act of 1970, and concurrently, requiring mitigation measures to protect surface resources.

The Helena Forest Plan contains a management standard (HNFP, pg. II/27) and criteria for evaluating existing and proposed mineral withdrawals (Appendix Q/2). The criteria for evaluating proposed withdrawals in the Helena Forest Plan are the same as those in the Lewis and Clark Forest Plan. They are discussed above in the Lewis and Clark Forest Plan: Forest-wide Direction section.

Helena Forest Plan: Management Area Direction

Unlike the Lewis & Clark Forest, the Helena Forest does not have a management allocation for mineral development areas.

The Helena Forest's part of the study area has six management allocations (R-1, W-1, W-2, M-1, L-1, L-2). The management areas for the Helena Forest are shown on Map 3-4. Management direction for the areas is shown in Table 3-3. Each

management area's direction provides for other resource objectives as long as their uses are compatible with the primary management area goals. Specific management standards, in addition to the forest-wide standards, are described for all uses, including minerals. Refer to Chapter 3 of the Helena Forest Plan for a complete description of goals and directions for these management areas.

TABLE 3-3: HELENA NATIONAL FOREST MANAGEMENT AREA DIRECTION

Helena NF Management Areas	Management Direction
MA L-1	Existing grazing allotments where extensive or intensive grazing systems may be used to optimize livestock production.
MA L-2	Existing grazing allotment in big game winter range. Vegetation will be maintained for both livestock and wildlife forage.
MA M-1	Lands where most resource development is uneconomical or infeasible. Investments made only to protect basic soil, water and wildlife resources.
MA N-1	Maintain natural conditions for Research Natural Area purposes.
MA R-1	Unroaded, undeveloped lands that provide a variety of semi-primitive nonmotorized recreation opportunities.
MA W-1	Variety of wildlife habitats with little grazing. Wildlife potential will be optimized. Timber harvesting only as a tool to enhance habitat.
MA W-2	Important spring, summer and fall wildlife habitat, with allotments. Wildlife habitat will be maintained or enhanced, and grazing will be maintained near 1983 levels.

Environmental Effects

Effects of Alternative A

Under Alternative A, approximately 405,000 acres of federal land would remain available for mineral entry. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes that a geologic mapping and geochemical and geophysical surveying program would take place once every ten years. Exploration by drilling is expected 5 times in 100 years. The probability of detailed drilling and development is much less (0.1%). These activities will not be covered in the effects discussion because their probability of occurrence is so low.

No federal lands would be withdrawn and there would be no amendments to the Helena or Lewis & Clark Forest Plans.

Effects of Alternative B

Under Alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes no mines would be developed and no other exploration would take place.

Management area direction on the Helena Forest is consistent with the proposed mineral withdrawal. Helena Forest Plan Appendix Q, Withdrawals from Mineral Entry, would be amended to include this mineral withdrawal.

Management area direction on the Lewis & Clark Forest is consistent with the proposed mineral withdrawal. Lewis & Clark Forest Plan, Table 2.2, Minerals, (page 2-13), displays acres of land under various management prescriptions for energy and non-energy resources. Under Alternative B, all acres on the Rocky Mountain Division in the Minerals non-energy section would fall under Category A, lands withdrawn (or proposed for withdrawal) from mineral entry. The plan would be amended to reflect the additional acres under mineral withdrawal. The proposed action would not result in a change in management emphasis or the level of goods and services to be provided for any

other National Forest resource. Forest Plan management allocations would not change.

Outputs and activities projected through implementation of the Lewis & Clark Forest Plan are found on page 2-10. This table shows that for minerals management, the Lewis & Clark Forest has a projected workload of approximately 90 cases per decade. Table II-1 in the Helena Forest Plan projects a minerals management workload of 300 cases per decade. The Forest Service has no jurisdiction over subsurface resources; therefore, Forest goals and objectives do not lead to target in terms of production (e.g. tons of ore, ounces of gold, etc.) The level of minerals management activity is also projected in anticipation of outside applications. The Forest Service does not promote or solicit for minerals exploration or development

HERITAGE RESOURCES

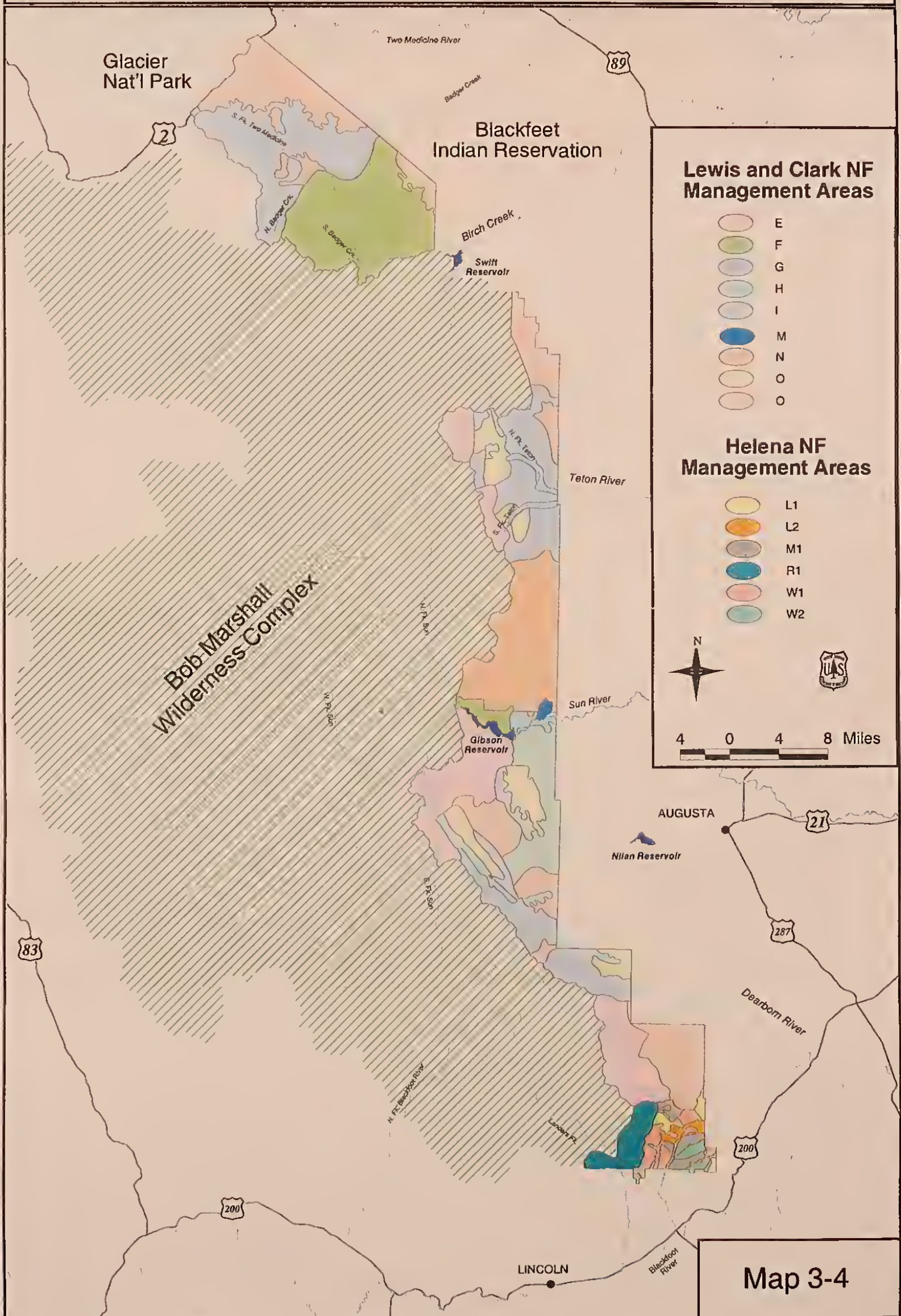
Introduction

Humans have occupied the North Central Montana Plains for at least 12,000 years. Material remains from archeological sites indicate that ancient Montanans relied on hunting wild game and collecting edible plant foods for subsistence. To acquire a wide variety of resources for survival, prehistoric groups followed a nomadic lifestyle moving camps periodically through the spring, summer and fall. As prehistoric people became more reliant on bison for subsistence, camp movement was often related to the migration of buffalo herds.

Descriptions of American Indian groups by anthropologists, early explorers and missionaries around the turn of the century provide information on nomadic lifestyles that characterized most Plains Indian groups. The annual movement pattern for many Plains tribes included a large winter encampment by the majority of bands in a tribe, followed by dispersal of bands in the spring to gather resources at favored locations. Individual bands gathered resources throughout summer and fall, although they often came together for religious occasions.

By researching the documents of early explorers and anthropologists and studying the cultural remains of prehistoric Plains Indians, archeologists have developed an understanding of past events common to these people. The events, or

Proposed Rocky Mountain Front Mineral Withdrawal Lewis and Clark and Helena National Forests



traditions, are described as cultural periods, which are then subdivided into complexes. Cultural periods describe the prehistory and history of the Plains region by segregating apparent similar socio/cultural trends, common material remains and changes in technology that occurred through time.

Cultural Periods

Prehistory is defined as the period of history occurring before written records were maintained. In the North Central Plains area this period begins about 12,000 years ago and terminates with the introduction of Euro American trade goods, generally estimated to be about A.D. 1700 (Greiser 1984).

Several systems describing the chronological development and cultural remains associated with prehistory of the Northwestern Plains have been constructed. Greiser's (1984) chronology, developed for the Northwestern Plains (specifically Southwestern Montana east of the Continental Divide), is used to broadly describe the prehistoric and historic events that occurred within the study area. Greiser proposes the following chronology:

Early Prehistoric Period (ca. 13000 - 5500 B.C.)
 Middle Prehistoric Period (ca. 5500 B.C.- A.D. 400)
 Late Prehistoric Period (ca. A.D. 200 - A.D. 1700)
 Proto Historic Period (ca. A.D. 1700 - A.D. 1800)

Early Prehistoric Period - Cultural groups associated with this period are characterized as hunters who used hand-held spears tipped with large lanceolate projectile points to harvest large mammals, which are now extinct (wooly mammoth and bison antiquus). Low human populations during this time resulted in widely spaced groups of few individuals. Consequently, remains from this time span are rare.

Middle Prehistoric Period - A slight increase in human populations occurs during the Middle Prehistoric. Subsistence during this time was based on broad scale hunting and gathering with no apparent preference for one species. This resulted in frequent camp movements to acquire seasonally available resources. Material remains indicate a change in technology from the spear to the atlatl (a throwing stick that increased the distance hunting darts could be thrown). Changes in weaponry resulted in subsequent modification of

projectile points to accommodate the new technology. Projectile points during this time are smaller and have different morphological characteristics than the projectile points of the preceding period.

Late Prehistoric Period - The population during this time span stabilized somewhat and preference for bison as the predominant food source gained favor. The bow and arrow became the preferred hunting weapon and greatly increased the effectiveness of prehistoric hunting and warfare. By the end of this period, most Plains people had experienced contact with Europeans and had acquired trade goods of metal and glass. Projectile points became smaller relative to earlier points and some were made from metal. The introduction of the horse significantly changed Plains Indian culture during this period.

Protohistoric - This period is characterized by a strong reliance on bison for subsistence, inter-tribal warfare, and a decline in Plains Indian populations. Increased contact with Europeans resulted in the introduction of several fatal diseases. The introduction of horses and firearms acted as a catalyst for warfare; both of which further decreased American Indian populations. Projectile points at this time were extremely small and often made of metal or were finely crafted of native rock.

Historic - The Historic Period, from roughly A.D. 1800 to the present, is marked by vast and significant changes to indigenous Indian tribes. The near extinction of bison, trapping, mining, farming and ranching all occurred during this period. A wide variety of cultural remains of various types characterize the Historic Period.

Management Direction

Since 1906, with the enactment of the Antiquity Act, four primary pieces of legislation have been passed which provide for the protection, management, and consideration of cultural resources on lands managed by federal agencies or affected by federal projects. The Historic Sites Act of 1935, the National Historic Preservation Act of 1966, as amended, the Archeological and Historic Preservation Act of 1974, and the Archaeological Resource Protection Act of 1979 all pertain to the management of cultural sites.

Probably the most significant piece of legislation for the preservation and management of cultural resources were passed in 1966. The National

Historic Preservation Act established the current process of cultural resource management in use today by federal agencies. Section 106 of this Act requires federal agencies to consider the effects of their actions on significant prehistoric and historic sites and Section 110 enables agencies to conduct interpretation of, and education regarding, cultural sites. The National Historic Preservation Act details the process of archeological survey, assessment of site significance, and consultation with the State Historic Preservation Officer.

In 1979, the Archaeological Resources Protection Act was passed to address the problem of site vandalism, illegal excavation, and illegal artifact collection. This Act established penalties for illegally impacting cultural sites on lands managed by the federal government.

The Native American Graves and Repatriation Act of 1990 legislated the manner in which Federal Agencies curated human remains, artifacts associated with human burials, and artifacts demonstrated to be essential for the practice of American Indian ceremonies. Pursuant to this law, human remains and certain categories of artifacts are returned to Tribal groups for proper disposition.

Numerous additional laws and regulations have been passed to preserve our cultural heritage but these rules apply to specific project types or geographical locations and are not often used in the management of cultural resources on National Forest lands. The effects to cultural resources are considered in analyses conducted pursuant to the National Environmental Policy Act (NEPA).

Affected Environment

Lewis & Clark National Forest

The Lewis & Clark Forest's Cultural Resource Automated Tracking System (CRATS), cultural resource atlas and pertinent literature provide information on existing cultural resource data assembled from field inventories. A review of the existing heritage data was conducted to assess the adequacy of the information and to determine what type of sites occur on the Forest, where they are located, and where certain types of sites can be expected to occur.

The review found that, to date, 4,121 acres of archaeological survey have been conducted within

the boundaries of the Rocky Mountain Ranger District. This level of survey represents an approximate 0.53 percent sample of the District and has resulted in the documentation of 110 cultural resource sites. While the majority of these sites are historic linear features (trails) and historic cabins, pictograph sites and prehistoric artifact scatters are also common. Currently, the district has an estimated site density of one site per thirty-seven acres of survey. This density is one of the highest on the Lewis & Clark Forest.

Past analysis of site location information supports the hypothesis that cultural resources can be found in a wide variety of land types and slope classes. Some site types, however, may be more commonly associated with specific land types and slopes. Over 61% of the pictograph sites recorded on the Lewis & Clark Forest are associated with steep topography (slopes greater than 40%), while approximately 75% of the recorded cabin sites are located in areas with slopes less than 40%. The majority of the remaining site classes (tipi rings, mining sites, homesteads, etc.) are situated in relatively level settings, or probable travel corridors, with slopes of less than 40%.

To supplement the CRATS database, field investigations of past mining activity and known potential mineral areas were conducted in 1999. A historic sawmill site was found within one mile of a recent mining claim. Additional areas with probable high site densities were also inspected and two prehistoric artifact scatters were recorded.

Helena National Forest

The Helena Forest portion of the study area encompasses approximately 26,000 acres. A review of the Helena Forest heritage resource atlas and site file data indicates that approximately 1,175 acres (about 5 percent) of the study area has been inventoried for heritage resources. Seven sites are recorded including the Lewis & Clark National Historic Trail, two prehistoric artifact scatters, three stone structure sites and a historic Forest Service lookout.

Six of the seven heritage sites are located in the upper Alice Creek drainage. This drainage contains the Lewis & Clark National Historic Trail. The Salish and Nez Perce Indians called this ancient Indian travel route the "Cokahlarishkit" or "river of the road to the buffalo". The trail was originally used to travel over the Continental Divide to buffalo hunting grounds on the northern and

central Plains. After the introduction of the horse in the early 1700s, the Blackfeet and the Crow used the trail to travel west of the Divide to raid horses from Salish Indians. Remnants of the trail, evidenced by trail and travois ruts, can be observed today in several areas in the Alice Creek drainage. Prehistoric artifact scatters and stone structures lying along the trail attest to its antiquity and centuries of continual use by American Indians, the Lewis & Clark expedition, early explorers such as John Mullan and Isaac Stevens, and Jesuit missionaries, including Nicolas Point (Scott 1999).

Within the Alice Creek drainage, the prehistoric artifact scatters, rock cairns and alignments are located on level to gently sloping terrain and along ridge tops. The Forest Service's Silver King fire lookout is situated on a mountaintop to afford fire lookouts expansive views required for fire surveillance. The lookout was built in 1937 and is potentially eligible for listing in the National Register of Historic Places.

Historic Mining Activities

Lewis & Clark National Forest

The historic mining overview for the Lewis & Clark Forest (Fulbright 1996) revealed only five mining claims has been staked within the boundary of the Rocky Mountain Ranger District. These five claims were located between 1906 and 1948.

According to Fulbright (1996:118):

"Relative to the Jefferson Division, the Rocky Mountain Division of the Lewis & Clark National Forest has little significant mining history. What makes this somewhat surprising is the proximity of this region to the mining activity in the Lincoln area, located west of the Continental Divide on the Helena National Forest."

Of these five documented claims, only one was filed as a hard rock lode claim. This claim is located outside the current analysis area in the Bob Marshall Wilderness. The remaining claims were either filed in bad faith or were filed to extract minerals for medicinal purposes. Two claims, now patented, are located within the project area on Lange Creek. These claims are now private land and are not included as part of the study area.

The Lange Creek claims were filed to extract melanterite (composed of aluminum, iron, magnesium, and sulfuric acid) for use as a healing agent. Melanterite was extracted from these claims by sluicing, panning, or scraping the rock faces where the mineral was seeping out.

Five historic mining claims in roughly 780,000 acres attest to the insignificant role of mining in this area. The density of historic mining sites is extremely sparse making the potential for profitable mining in the study area unlikely.

Helena National Forest

Historic mining records for the Helena Forest, including Land Status Records, Government Land Office plat maps and mineral survey entry records, were examined to determine the presence of patented and unpatented mining claims. Within the study area, many mining claims have been filed over the years, but none have been patented. Their owners did not keep these claims valid, thus, there are no existing claims. Several claims were filed between 1978 and 1993 along the upper reaches of Alice Creek. In fact, the current road that parallels the west fork was constructed so claims could be explored. Mining claims that have been filed in this area were small in scale.

Traditional Cultural Properties (TCPs)

Lewis & Clark National Forest

A traditional cultural property is defined as:

"A property that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that: (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community."

Existing ethnographic information compiled for the Lewis & Clark Forest was reviewed to identify potential traditional cultural properties for this study. Documents reviewed include an archival study of ethnographic sources completed in 1992 (Beidl), an ethnographic study completed in 1993 (Greiser and Greiser) and an ethnographic overview completed in 1995 (Deaver 1995a).

During 1991 and 1992, 37 members of the Blackfeet Indian Tribe shared information about traditional cultural use and traditional cultural sites

in the Badger - Two Medicine area with Historical Research Associates. The Badger - Two Medicine area lies within the northwest portion of the current study area. Several other tribal members were interviewed but declined comment due to the sensitivity of the issue. Several traditional cultural properties and areas of concern were identified. These properties form a potentially eligible district of traditional cultural sites, which covers one-third of the Badger-Two Medicine area.

The northern and eastern Shoshone, the Kootenai, Salish, Blackfeet, Metis, Little Shell Band of the Chippewa-Cree, Nez Perce, Shoshone-Bannock, Gros Ventre, Crow and Northern Arapaho were consulted during the ethnographic study conducted by Deaver (1995a). During the study, 35 individuals were interviewed about potential traditional cultural use or locations of traditional cultural properties within the Lewis & Clark Forest. Discussions with Tribal members resulted in the definition of twelve sensitive site types, or sites which are, "most likely to cause great concern to Indian communities" (Deaver 1995a: 34). Pictographs, tipi rings smaller than 3.5 meters or larger than 7 meters in diameter, monumental rock features (medicine wheels, effigies, etc.), cairns, vision quest locations, eagle catching pits, sweat lodges, conical timbered lodges, communal kill sites and quarries were designated as sensitive site types.

Lands administered by the Rocky Mountain District have been determined to have a high potential of containing TCPs on the Lewis & Clark Forest.

Helena National Forest

In 1995, a study of traditional cultural properties was conducted in an area four miles south of the study boundary on the Helena National Forest (Deaver 1995b). This study was part of the Seven-Up Pete Joint Venture mining project. The Blackfeet, Kootenai, Nez Perce, Salish, Shoshone-Bannock and Eastern Shoshone were consulted about TCP properties located within Seven-Up Pete project area. Rock cairns, suspected to mark the Cokahlarishkit (Lewis & Clark) Trail, were identified and recommended as eligible for listing in the National Register of Historic Places (Deaver 1995b). The Cokahlarishkit Trail was recommended as significant to the Blackfeet, Nez Perce and Salish Indians because of its historic importance as a travel route for buffalo hunting, horse raiding and intertribal warfare.

No specific TCP studies have been conducted within the study area on the Helena Forest.

Environmental Effects

A risk analysis was used to identify potential effects to heritage resources. This analysis, in Appendix E, is the basis for the effects discussed below.

Effects of Alternative A

Under Alternative A, approximately 405,000 acres of federal land would remain available for mineral entry. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes that a geologic mapping and geochemical and geophysical surveying program would take place once every ten years. Exploration by drilling is expected 5 times in 100 years. The probability of detailed drilling and development is much less (0.1%). These activities will not be covered in the effects discussion because their probability of occurrence is so low.

Mineral exploration activities, including geologic mapping, geochemical surveying, geophysical surveying and trenching have the potential to impact cultural resources, although this potential is limited. Mapping and surveying geologic features with no associated ground disturbance would not affect cultural sites but exploration activities that involve ground disturbance (trenching, blasting, road building and drilling) may affect cultural sites.

The Forecast for Future Mineral Activity (Appendix C) predicts the occurrence of one mineral exploration activity within the analysis area every ten years. An activity that has a low potential for impact and only occurs once every ten years in an area of 405,000 acres would have an extremely low potential to affect prehistoric or historic cultural resources. The requirements of the National Historic Preservation Act for exploration activities further reduce the potential for this alternative to affect cultural sites.

Analysis conducted to assess the risk of impacts to cultural sites indicates that Alternative A would have a low potential to affect cultural resources, except in Alice Creek drainage where the risk of impacts would be moderate. The Alice Creek area

contains a variety of important heritage resources including the National Historic Trail.

Effects of Alternative B

Under Alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes no mines would be developed and no other exploration would take place.

Alternative B would not impact cultural sites, would eliminate any potential to effect sites under Alternative A, and would possibly offer protection to certain types of cultural sites and ongoing traditional cultural use.

Consistency of Alternatives with Forest Plan Direction

Both alternatives are consistent with the Helena and Lewis & Clark Forest Plan direction. The withdrawal could make it easier to protect heritage resources and traditional cultural value.

WILDLIFE AND SENSITIVE PLANTS

Substantive Changes Between the Draft EIS and the Final EIS

In the discussion on small carnivores, the Canada lynx was changed from proposed to threatened. U.S. Fish and Wildlife Service listed Canada lynx on March 24, 2000.

Introduction

This section addresses concerns about wildlife and describes the status of sensitive plants. The introduction is followed by information on management direction, and then affected environment and environmental effects. Wildlife and habitat conditions for five wildlife groups are each followed by a discussion of potential effects. The section concludes with information on sensitive plants and potential effects to them.

The study area is rich in natural diversity and wildlife resources. The Rocky Mountain Front is one of the only areas left in the United States that is still home to all of the wildlife present when Europeans arrived. There has been relatively little human disturbance, such as timber harvest, mining, oil and gas development, and road construction in this area. The result is a large area of relatively undisturbed habitat that has allowed many species to thrive when they have disappeared from most of the rest of their range.

The Sun River elk herd is one of the better-known herds in the state of Montana. Many people have been dedicated to ensuring the herd's success. In 1913, the Montana State Legislature established the Sun River Game Preserve in the summer range west of the North and South Forks of the Sun River. The preserve was created to protect the elk herd. As the elk herd grew, conflicts increased on winter ranges found on private lands. These conflicts lead to the establishment of the Sun River Game Range in 1948. Since that time, two more state game ranges, now known as wildlife management areas, have been established to benefit wildlife on the Rocky Mountain Front.

The Sun River bighorn sheep herd is also well known throughout the state. Many herds have been reintroduced or supplemented with sheep from the Sun River herd. The mountain goat herds along the Rocky Mountain Front have also played an important role in Montana. It is estimated that over one-third of the goats transplanted in the state of Montana came from the study area (Joslin 1986).

In addition to high profile big game herds, the Rocky Mountain Front is home to a full suite of predators. Grizzly bears still roam the plains in this area. Throughout the spring, summer and fall, bears can be found in the productive fens and river bottoms east of the study area. Several wolf packs have attempted to become established on the Rocky Mountain Front. Lynx, wolverine and pine martin are known to haunt the undisturbed high country.

Eighteen sensitive plants species are known to occur in the study area. Most of the study area is very remote. Other sensitive plant populations or species are likely to occur.

Management Direction

Threatened and Endangered Species

The Endangered Species Act of 1973, as amended, mandates federal agencies to conserve endangered and threatened plant and animal species and assist in their recovery. These species are managed cooperatively with Montana Fish, Wildlife and Parks (MFWP) and the U.S. Department of Interior, Fish and Wildlife Service (USFWS). A more in depth discussion of effects is included in Appendix F, Biological Assessment.

USFS Sensitive Species

Sensitive species are those identified by the Regional Forester, Northern Region, U.S. Forest Service, for which population viability is a concern, as evidenced by: (1) significant current or predicted downward trend in population numbers or density; and/or (2) significant current or predicted downward trends in habitat capability that would reduce a species existing distribution (FSM 2670.5).

USFS Management Indicator Species

The National Forest Management Act of 1976 (NFMA) required National Forests to select a group of representative fish and wildlife species whose populations could be monitored relatively easily. Responses of these species to management activities are used as an indicator of effects on other species that require similar habitat.

WILDLIFE

This wildlife analysis is organized to display relationships between species and their dependence upon each other. Rather than using categories like Threatened and Endangered Species, Sensitive Species or Management Indicator Species, an association approach is used. Individual threatened, endangered, sensitive and management indicator species have been categorized based on their predator/prey or habitat relationships.

In the following section, the associated species categories show the species with their classification as endangered (E), threatened (T),

proposed (P), sensitive (S) or management indicator species (M).

Most of the wildlife information for the study area was obtained from surveys and monitoring conducted by the U.S. Forest Service (USFS) and Montana Fish, Wildlife and Parks (MFWP) biologists. In addition, information was used from research studies conducted by MFWP biologists and graduate students in preparing the Rocky Mountain Front Guidelines (USDI BLM 1987).

A risk analysis was used to identify potential effects to wildlife and sensitive plants. This analysis, in Appendix E, is the basis for the effects discussed below.

Large Carnivores

Affected Environment

Predator Species: grizzly bear (T), black bear (M), gray wolf (E) and mountain lion (M).

Prey Species: elk (M), mule deer (M), whitetail deer (M), bighorn sheep (M) and mountain goat (M).

The Rocky Mountain Front is one of the few wild areas in the United States where all of the large predators present during the Lewis and Clark era (1800's) are still found. It is the last place where grizzly bears still leave the mountains to use the grasslands and river corridors on the plains. Prey species are also abundant. The study area provides habitat for many large ungulates that serve as the primary prey for wolves, grizzly bears, black bears and mountain lions.

Nearly all of the study area is classified as Management Situation One grizzly bear habitat. Several small areas are classified as Management Situation Three grizzly bear habitat. These are areas around campgrounds and other sites with heavy human development. Potential spring range and denning habitat for grizzly bear has been mapped (Map 3-5). Spring habitat areas are used from April 1 to June 30 on average. During the spring, most bears in the study area are below 2000 meters (6560 feet) in elevation. During this time, they are searching for plant material and carrion to replace reserves used during the denning period. Habitat components most commonly used during spring include closed Place

timber, aspen stands, riparian areas and open timber stands (Aune and Kasworm 1989). Denning habitat is used from approximately October 15 to April 15. Most den sites are located above 1900 meters (6232 feet) in elevation, on slopes greater than 30% (Aune and Kasworm 1989). Grizzly bears forage on a wide variety of food items. Ungulate prey species are particularly important during spring and fall in the study area (Aune and Kasworm 1989). The bears use plant products, insects and mammals during the rest of the year.

There are no known established wolf packs within the study area. Several packs have attempted to become established along the Rocky Mountain Front in the past 10 years. The Sawtooth pack lasted longest. This pack was first identified in 1993 (Diamond and Finnegan 1994). The pack was removed by USFWS in 1996 after a series of livestock depredations. In 1999, a radio-collared female traveled across the continental divide from Spotted Bear to the Rocky Mountain Front. She joined with two uncollared males. These wolves were also removed after several livestock depredations. Three wolves have been reported in the Alice Creek area. It is unknown if they have formed a pack. Lone wolves are reported periodically and are presumed to be traveling through the study area.

Distribution of black bears within the study area is probably similar to that of grizzly bears. Black bears generally den at lower elevations than grizzly bears, but their habitat use patterns are similar. Habitat components most commonly used are open timber, closed timber and aspen stands (Aune and Kasworm 1989).

Mountain lions are found throughout the study area. They are generally found in areas where cover gives them opportunity to stalk prey (Williams 1992). Their preferred prey is large ungulates. Deer are taken most frequently (Williams 1992).

Seasonal ranges have been identified for all ungulate species occurring in the study area. In most cases, ungulate winter ranges are outside of the National Forest boundary and include adjacent private lands. The exception to this is mountain goats, which spent the entire year within the forest boundary. Exact population numbers for the prey species are unknown. However, it appears population trends are stable to increasing, according to data collected by MFWP.

Mule deer are found in the shrub fields and open timber stands in the study area. In the past 5 years, populations north of the Teton River have remained stable. Mule deer numbers south of the Teton River are low but appear to have stabilized.

Elk are found throughout the study area. The elk population on the north half of the study area has been increasing. They are also beginning to spend more time on the plains and less on the National Forest. Elk numbers in the Sun River herd are down, but seem to be increasing.

Bighorn sheep populations appear to be stable in the north end of the project area. Some of the herds in the south are also stable. The Sun Canyon and Benchmark herds appear to be maintaining themselves. Sheep populations in the Gibson Reservoir area between Mortimer Gulch and Sheep Reef appear to have declined. The herd in the Deep Creek area has declined to the point that MFWP supplemented the population in March 1999.

Mountain goats in the area from the Sun River north to the Teton have begun to recover from the 1980s decline. Recent surveys completed by MFWP indicate an increase in production of kids, resulting in a stable to slight increase in the goat population. The goat population in the Birch Creek and Badger Creek areas appear to be stable to increasing as well.

Environmental Effects

Effects of Alternative A

Under Alternative A, approximately 405,000 acres of federal land would remain available for mineral entry. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes that a geologic mapping and geochemical and geophysical surveying program would take place once every ten years. Exploration by drilling is expected 5 times in 100 years. The probability of detailed drilling and development is much less (0.1%). These activities will not be covered in the effects discussion because their probability of occurrence is so low.

If the No Action alternative were implemented, the consequences to the large carnivore group would

range from negligible to moderate. These effects are based on activities expected under the Forecast for Future Mineral Activity (Appendix C).

Prospecting and claim staking is expected once every ten years within the study area. The consequences of these activities on the large carnivore group would be negligible to low.

Prospecting and claim staking would not affect the large carnivore habitat. Collection of soil samples and testing using hand-held instruments would not modify the vegetation in the study area.

Prospecting and claim staking would not affect the large carnivore mortality rates. The personnel conducting the sampling would have to follow the same rules and regulations as any other forest user. This would include restrictions on access, food storage and camping. There would be no habitat modifications and no change predation or hunting pressure. Disturbance resulting from prospecting and claim staking would be limited. There would be a slight increase in human presence in the area being sampled. This would be a short-term disturbance lasting up to several months. After an area is sampled, the disturbance would be gone. There would be an increase in off-trail travel, as the samplers cover the area of interest. Some animals may be disturbed by the increased presence of people. They would be able to disperse from the people while the area is sampled. Because the time spend on the sampling would be limited, this disturbance would not result in displacement of animals from their home ranges.

Exploration drilling or trenching is expected to take place approximately five times in one hundred years. These activities would have a greater impact on the large carnivores than prospecting and claim staking. The consequences would range from negligible to moderate, depending on the location and scale of the drilling activities.

The effects of a drilling program on habitat for the large carnivore group would range from low to moderate. The primary impact on habitat would come from road construction. Drilling rigs generally use roads to access drill sites. If roads are not present, they must be constructed. Helicopters have been used to move drilling equipment, but they are not generally cost-effective. The direct modification of habitat by construction of a road would be minimal. Only the vegetation in the roadbed and along the shoulders would be disturbed. Drilling activities generally

take place within the road and do not require additional pad construction. Roads, once constructed, reduce the effectiveness of habitat for some of the species in the large carnivore group. Grizzly bears, black bears and elk have been found to avoid roaded areas (Joslin and Youmans 1999).

Mortality for the large carnivore group would range from negligible to moderate if a drilling program took place. Much of this would depend on how the roads constructed for a drilling or trenching operation were managed. If the roads were restricted to the drilling operations only and then reclaimed and closed, the mortality risk would be negligible. If a road were left open, the risk would increase with increased traffic and access for humans. The control of roads constructed for these operations is within the jurisdiction of the Forest Service.

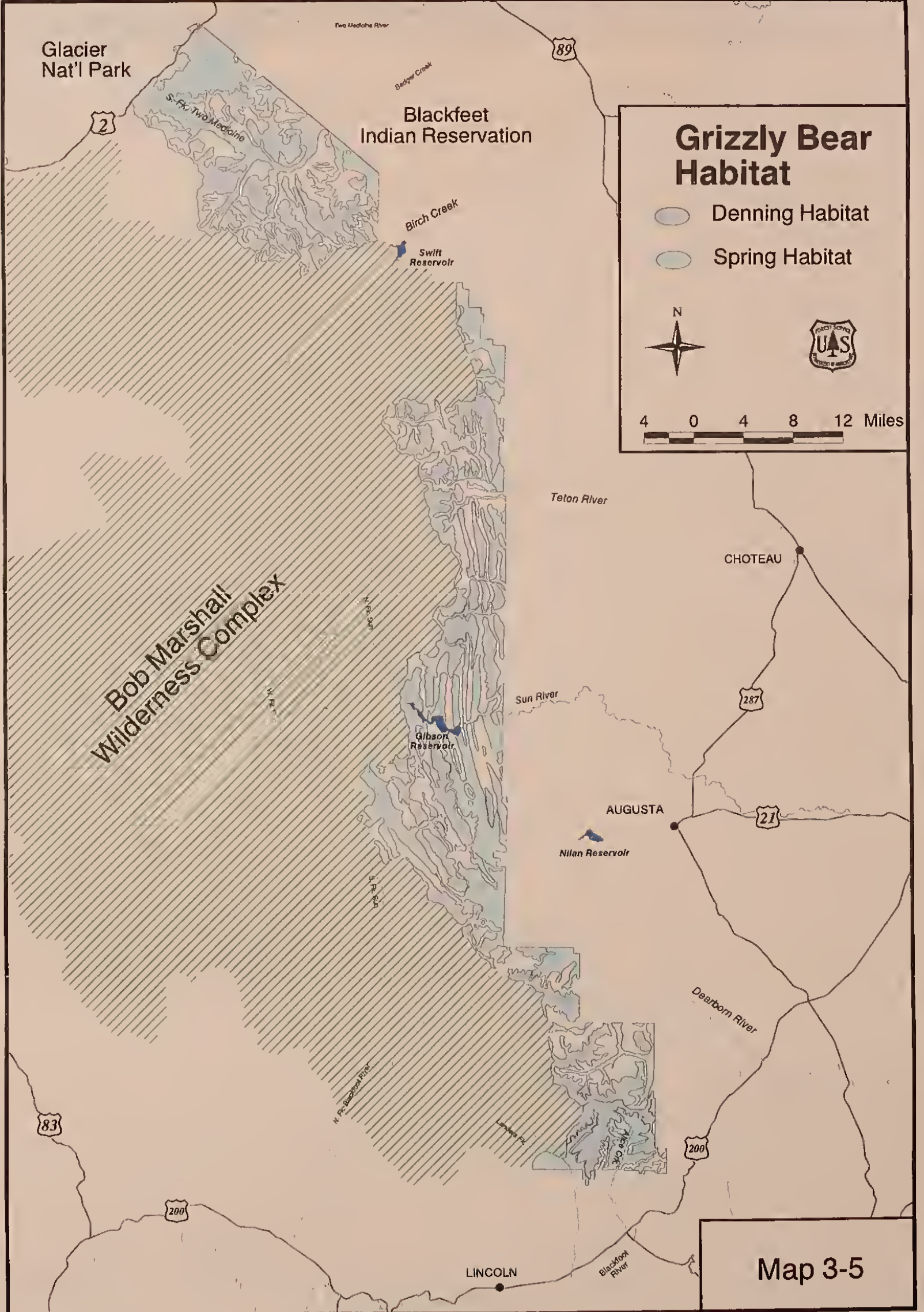
The primary impact of a drilling or trenching operation would be disturbance. There would be an increased human presence in the area of drilling or trenching. Construction of an access route would displace some animals, as would the activities surrounding the drilling operations. Much of the disturbance would depend on where and when the activities took place. If operations were proposed in an elk calving range or bighorn sheep winter range, the potential for disturbance when those animals were present would be great.

Effects of Alternative B

Under Alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes no mines would be developed and no other exploration would take place.

If this alternative were implemented, there would be no effects to the species within the large carnivore group from mining related activities. Other activities ongoing or planned in the near future would continue and the effects of these activities would not change.

Proposed Rocky Mountain Front
Mineral Withdrawal
Lewis and Clark and Helena National Forests



Map 3-5

Small Carnivores

Affected Environment

Predator Species: wolverine (S), lynx (T)
pine marten (M), bobcat (M) and fisher (S)

Prey Species: blue grouse (M), deer (M), snowshoe hare and rodents

Distribution and seasonal range is not as well researched for the small carnivore group as it is for the large carnivore group. Small carnivores are more difficult to survey, due to their secretive nature. Surveys have documented the presence of lynx, wolverine, pine marten, bobcat and possibly fisher in the study area. Due to the difficulty of locating these animals, population estimates are not available.

The USFS and MFWP use winter track surveys to document the presence of small carnivores. Wolverines are generally found in more remote portions of the study area. Most wolverine observations in the study area are in old growth and mature timber (Finnegan 1992). Lynx observations in the study area are in forested lands that accumulate deep snow during the winter (Finnegan 1992). Tracks believed to be fisher have been recorded in the study area. They were not confirmed as fisher because of the difficulty in separating small fisher tracks and large pine martin tracks (Finnegan 1992). Fishers do not appear to be widely distributed across the study area. Pine marten have been found in old growth or mature spruce/fir forests (Finnegan 1992). Bobcats are found at lower elevations than lynx. They are unable to hunt in deep snow, so track sightings are less frequent. Bobcats have been documented in the study area (Finnegan 1992).

Small carnivores prey on small mammals, birds and carrion. Wolverines are known to feed on both large ungulate (deer and elk) carrion and small mammals such as snowshoe hare and squirrels (Banci 1994). Lynx also prey on snowshoe hare and squirrels and may occasionally feed on carrion (Koehler and Aubry 1994). Pine martens are considered generalists in their diet. They prey on small birds and mammals and forage for carrion, bird eggs, insects and fruits (Buskirk and Ruggiero, 1994). Fishers are also general in their diets. They prey on small to medium sized birds and mammals and will eat carrion and plant material (Powell and Zielinski 1994). Bobcats are also generalists in their diets.

Evidence of prey species is recorded during surveys for small carnivores. Tracks of snowshoe hare and squirrels are noted on the survey forms. Prey species appear to be readily available. Snowshoe hare populations in Montana do not fluctuate like they do in the northern part of their range. Blue grouse populations are stable in the study area. Their numbers may vary from year to year, depending on brood success.

Environmental Effects

Effects of Alternative A

Under Alternative A, approximately 405,000 acres of federal land would remain available for mineral entry. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes that a geologic mapping and geochemical and geophysical surveying program would take place once every ten years. Exploration by drilling is expected 5 times in 100 years. The probability of detailed drilling and development is much less (0.1%). These activities will not be covered in the effects discussion because their probability of occurrence is so low.

The effects of this alternative on the small carnivore group would be similar to those described for the large carnivore group. Less is known about how human activities affect the members of this group. The focus of research related to this group has been on trapping and habitat modification (Claar et al. 1999). As stated previously, the activities projected in the Forecast for Future Mineral Activity (Appendix C) would not result in large-scale habitat modification. Prospecting and claim staking would not change any habitat or increase access to the study area.

Exploration drilling and trenching has greater potential for adverse effects to the members of this group. If a road was constructed into habitat occupied by these species, they may be more vulnerable to trapping. Increased human disturbance may also lead to abandonment of dens and kit-rearing areas.

Effects of Alternative B

Under Alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for mineral activity, which was developed as one possible scenario for analysis

purposes, assumes no mines would be developed and no other exploration would take place.

If this alternative were implemented, there would be no effects to the species within the small carnivore group from mining related activities. Other activities ongoing or planned in the near future would continue and the effects of these activities would not change.

Avian Carnivores

Affected Environment

Predator Species: golden eagle (M), peregrine falcon (S), prairie falcon (M) and northern goshawk (S)

Prey Species: neotropical birds, blue grouse (M), three-toed woodpecker (M), black-backed woodpecker (S), pileated woodpecker (M), hairy woodpecker (M) rodents

Avian carnivores are both cliff and tree nesters. They feed on a variety of prey including birds, small mammals, reptiles, fish and carrion.

There are no known active peregrine falcon eyries in the study area. Extensive surveys conducted along the Rocky Mountain Front from 1981 to 1983 (Dubois 1984) did not locate any peregrine falcon eyries. Potential nesting sites for peregrine falcons and existing nest sites for prairie falcons were identified on most major cliff faces on the Rocky Mountain Front.

A peregrine falcon hack site was established on the cliffs overlooking Wood Lake, on the Rocky Mountain Ranger District, in June 1995. A hack site is location where a box is used to rear young birds until they are old enough to live on their own. Ten birds are known to have successfully fledged from 1995 to 1997. In addition to the birds placed on the National Forest, 19 peregrine falcon chicks were successfully fledged at Willow Creek Reservoir, approximately 10 miles east of the study area (Peregrine Fund 1997)

None of the falcons released are known to have established nesting territories on the Rocky Mountain Ranger District. Surveys in the study area and observations from fire lookouts near the project area have recorded prairie falcons, but no peregrine falcons.

Golden eagles can also be found nesting on cliffs within the study area. To date, most of the mapped territories are along the eastern boundary of the Rocky Mountain Front. Golden eagles establish their nest territories close to the prey base. The eastern portion of the Front appears to be preferred because of the abundance of ungulates along the mountain-prairie interface and the availability of suitable cliffs.

Northern goshawks use a variety of habitats across the landscape. They generally nest in stands with large trees and dense canopies, typically on north slopes (Reynolds et al. 1992). Eleven nesting territories have been found on the Rocky Mountain Ranger District. Alternate nests have been located in several of these territories. Goshawk nests in the study area are found in mature stands of timber, usually along drainages.

Avian carnivores, with the exception of golden eagles, seek live food and are not known to utilize carrion. Falcons and northern goshawk prey on small birds (both resident and neotropical migrants) and mammals for their main source of food. Golden eagles will prey on rodents, rabbits and young prairie and peregrine falcons, if the adults are not present. They will also take young deer, antelope, mountain goat and bighorn sheep. Avian carnivores are distributed throughout the study area.

Exact population numbers for this group are unknown. The latest information from the breeding bird survey indicates that golden eagle populations are stable or increasing and prairie falcon populations are stable (Sauer et al. 1997). There is no goshawk population information on the breeding bird survey. The population trend for the majority of prey species (woodland breeding birds, neotropical migrants and permanent resident birds) is positive (Sauer et al. 1997).

Black-backed and three-toed woodpeckers have been sighted in the study area; however, habitat is limited. They generally prefer to nest and forage in recently (within 3 years) burned areas. A fire burned approximately 700 acres in 1999 on the southern end of the study area. This is the only large fire to burn in the study area within the past 3 years.

Pileated and hairy woodpeckers are cavity-nesting birds. Pileated woodpeckers are associated with mature and old growth forests. Hairy woodpeckers are found in forests that are more open. Insects make up the majority of the diet of these woodpeckers. Carpenter ants are a large part of the diet of pileated woodpeckers. Hairy woodpeckers

feed mainly on insects associated with dead and dying trees (Scott et al. 1977). Both species have been sighted within the project area.

Environmental Effects

Effects of Alternative A

Under Alternative A, approximately 405,000 acres of federal land would remain available for mineral entry. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes that a geologic mapping and geochemical and geophysical surveying program would take place once every ten years. Exploration by drilling is expected 5 times in 100 years. The probability of detailed drilling and development is much less (0.1%). These activities will not be covered in the effects discussion because their probability of occurrence is so low.

If the No Action alternative were implemented, the consequences to the avian carnivore group would range from negligible to moderate. These effects are based on activities expected under the Forecast for Future Mineral Activities (Appendix C).

Prospecting and claim staking is expected once every ten years within the study area. The consequences of these activities on the avian carnivores would be negligible to low.

Prospecting and claim staking would not affect the avian carnivore habitat. Crews collecting samples may disturb nesting birds. Disturbances near the nest can cause nest abandonment. It may also result in young leaving the nest prematurely. If a sampling crew moved through a nest territory quickly, the impact would be minimal. Repeated disturbances would increase the chance of nest failure.

Exploration drilling or trenching is expected to take place approximately five times in one hundred years. These activities would have a greater impact on the avian carnivores than prospecting and claim staking. The consequences would range from negligible to moderate, depending on the location and scale of the drilling activities.

The effects of drilling and trenching activities would depend on where they took place. If they were located near an active territory, the effects would be greater. The habitat of the birds would not be highly modified by drilling or trenching activities. A road, if constructed, would not modify a large area of habitat.

If the road were constructed through a nesting territory, it would modify a key portion of the habitat, possibly causing territory abandonment. The members of the avian carnivore group are sensitive to human disturbance.

The chances of nest abandonment are high if drilling or trenching activities take place near an active nest. Drilling activities would need to take place outside of the nesting season. If a road near a nest territory were left open, high use would lead to abandonment of the territory. If the adult birds are flushed off the nest when they are incubating eggs or young, the chances of nest failure are increased. When the adults are off the nest, the young may be subject to predation, cooling, overheating or ejection from the nest.

Effects of Alternative B

Under Alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes no mines would be developed and no other exploration would take place.

If this alternative were implemented, there would be no effects to the species within the avian carnivore group from mining related activities. Other activities ongoing or planned in the near future would continue and the effects of these activities would not change.

Avian Insectivores

Affected Environment

Townsend's big-eared bat (S)

Townsend's big-eared bats are presumed to inhabit the study area, although no sightings have been documented. The abundance of caves along the Rocky Mountain Front could serve as hibernacula (over-wintering areas) and roost sites for this species. Townsend's big-eared bats feed on small moths and other insects. They forage in the timber canopy or along edges of timbered stands (Kunz and Martin 1982).

Environmental Effects

Effects of Alternative A

Under Alternative A, approximately 405,000 acres of federal land would remain available for mineral entry. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes that a geologic mapping and geochemical and geophysical surveying program would take place once every ten years. Exploration by drilling is expected 5 times in 100 years. The probability of detailed drilling and development is much less (0.1%). These activities will not be covered in the effects discussion because their probability of occurrence is so low.

It is difficult to make a determination of effects on bats without a site-specific proposal. The bat species included in this document has never been documented to occur in the study area. Activities that disturb caves used as roost sites or hibernacula would have a negative impact on bats

Effects of Alternative B

Under Alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes no mines would be developed and no other exploration would take place.

If this alternative were implemented, there would be no effects to the species within the avian insectivore group from mining related activities. Other activities ongoing or planned in the near future would continue and the effects of these activities would not change.

Water Associates

Affected Environment

bald eagle (T), harlequin duck (S), northern bog lemming (S), boreal toad (S), northern leopard frog (S), common loon (S) and beaver (M)

Bald eagles are not known to nest within the study area. They are often seen soaring the winter ranges for carrion. All known nest sites are associated with river corridors outside of the study area. No roosting sites have been documented in the study area. Bald eagles migrate along the Rocky Mountain Front during the spring and fall.

Harlequin ducks are found on remote and undisturbed streams flowing through the Rocky Mountain Front. Ducks have been observed on 18 streams. Their distribution ranges from the Badger-Two Medicine area to 65 miles south near Straight Creek. Harlequin ducks are most abundant in the Badger Creek and Sun River drainages (Diamond and Finnegan 1993).

One population of bog lemmings has been identified in the study area (Reichel and Beckstrom 1994). A single female was caught in a fen-meadow-beaver pond complex southeast of Wood Lake, along Wood Creek. No additional individuals were captured in sampling efforts. A total inventory of habitat and the species has not been completed.

Boreal toads have been located across the study area. Breeding sites have been confirmed in the Teton, Sun and Two Medicine River drainages. They generally breed in the warm sections of ponds with shallow gently sloping shorelines (USFS 1998).

No northern leopard frogs have been located in surveys of the study area. A museum specimen was collected on the Sun River in 1958 (Reichel 1995). This is the only known occurrence within the study area.

There are no known breeding sites for the common loon in the study area. They are occasionally reported on Gibson Reservoir, Diversion Lake and other bodies of water east of the study area.

The beaver is widely distributed throughout the study area. They are found on shallow gradient (<15%)

perennial streams supporting willow, aspen and cottonwood communities. They depend on adequate water flow and ample food sources (Olson and Hubert 1994).

Environmental Effects

Effects of Alternative A

Under Alternative A, approximately 405,000 acres of federal land would remain available for mineral entry. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes that a geologic mapping and geochemical and geophysical surveying program would take place once every ten years. Exploration by drilling is expected 5 times in 100 years. The probability of detailed drilling and development is much less (0.1%). These activities will not be covered in the effects discussion because their probability of occurrence is so low.

Prospecting and claim staking would have negligible to low consequences on the species in the water associates group. There would be no modification to these species' habitats. Sampling and claim staking would not affect any wetlands, streams, rivers or lakes. There would be no change in the mortality risks for these species. Disturbance is possible when personnel are collecting samples. Harlequin ducks are susceptible to disturbance, particularly when they are young. Ducklings flushed away from the stream bank may be swept away in high water. These species will tolerate short, limited disturbances. If personnel are moving through an area, most of these species will not be affected.

Drilling and trenching could have more of an impact to this group. If drilling and trenching activities were located away from water, there would be no impact. If drilling and trenching activities were located near a body of water, impacts are probable. Bald eagles, harlequin ducks and common loons would be displaced by increased activity near their territories. Northern bog lemmings are only known at one site within the study area. The population could be lost if this site was impacted by drilling, trenching or road building.

Effects of Alternative B

Under Alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes no mines would be developed and no other exploration would take place.

If this alternative were implemented, there would be no effects to the species within the water associate group from mining related activities. Other activities ongoing or planned in the near future would continue and the effects of these activities would not change.

Consistency of Alternatives with Forest Plan Direction

Both alternatives are consistent with the Helena and Lewis & Clark Forest Plan direction. The withdrawal could make it easier to maintain habitat for threatened and endangered, sensitive, and management indicator species called for in the Forest Plans.

USFS NORTHERN REGION SENSITIVE PLANTS

Affected Environment

There are no known occurrences of plants classified as threatened or endangered under the Endangered Species Act of 1973 in the study area. The Regional Forester's 1999 sensitive plant list includes 18 sensitive plant species known to occur in the study area. Sensitive plants are those species for which population viability is a concern.

The information on sensitive plants is based on inventories conducted under contract with the Montana Natural Heritage Program, by Forest Service employees and volunteers. Information on the occurrence of sensitive plant species has been acquired both from surveys and from the database maintained by the Montana Natural Heritage Program.

Sensitive plants generally have very specific habitat requirements. They often have rather narrow ecological requirements, and are found with

**TABLE 3-4: USFS NORTHERN REGION SENSITIVE PLANTS
KNOWN TO OCCUR IN THE STUDY AREA**

(USDA Forest Service 1999)

Species Name	Occurrences		Habitat	
	Study Area	Montana	Category	Description
Ascending moonwort (<i>Botrchium ascendens</i>)	1	1	Alpine	Occurs on open meadows with herbaceous successional vegetation in the alpine zone
Austin's knotweed (<i>Polygonum douglasii</i> var. <i>austinae</i>)	2	10	Alpine & Meadow	Occurs in meadow openings in the forest to near alpine, usually on sparsely vegetated, dry gravelly (often shale derived) soils of eroding slopes and banks
Blunt-leaved pondweed (<i>Potamogeton obtusifolius</i>)	1	5	Riparian	Occurs in ponds sloughs and lakes, usually at lower elevations
English Sundew (<i>Drosera angelica</i>)	2	23	Riparian	Occurs with sphagnum moss in wet organic soils of fens in montane zone
Front Mountain fleabane (<i>Erigeron lackschewitzii</i>)	11	12	Alpine	Occurs in open gravelly calcareous soil and talus on ridge tops and tundra in alpine zone
Fuzzy-spike wildrye (<i>Elymus innovatus</i>)	1	3	Riparian	Occurs in sandy, cobbly soils along streams and floodplains
Giant Helleborine (<i>Epipactus gigantea</i>)	1	18	Riparian	Occurs along streams, seeps and springs, often near thermal waters
Kidney-leaved violet (<i>Viola renifolia</i>)	1	16	Riparian & Forest	Occurs in swampy or boggy soil in forests in montane zone
Lackschewitz milkvetch (<i>Astragalus lackschewitzii</i>)	8	8	Alpine	Occurs on alpine turf slopes, scree and rockslides
Linear-leaved sundew (<i>Drosera linearis</i>)	2	4	Riparian	Occurs in wet, organic soils of nutrient poor fens in montane zone
Macoun's gentian (<i>Gentianopsis macounii</i>)	1	4	Riparian	Occurs in wet, organic soils of calcareous fens in valley and foothill zones
Pale sedge (<i>Carex livida</i>)	2	25	Riparian	Occurs in wet organic soils of fens in foothill and montane zones
Peculiar moonwort (<i>Botrchium paradoxum</i>)	2	7	Alpine & Meadow	Occurs on open meadows with herbaceous successional vegetation or in the alpine
Round-leaved orchid (<i>Amerorchis rotundifolia</i>)	13	25	Riparian	Occurs in coniferous forest wetlands in seepage areas and along streams
Small yellow lady's slipper (<i>Cypripedium parviflorum</i>)	6	43	Riparian	Occurs in wetlands under tree or riparian shrub canopy often near streams or seeps
Sparrow's egg lady's slipper (<i>Cypripedium passerinum</i>)	7	23	Riparian	Occurs in coniferous forest wetlands along seeps and streams
Stalked-pod crazyweed (<i>Oxytropis podocarpa</i>)	4	5	Alpine	Occurs on alpine ridges and slopes, often on limestone
Water bulrush (<i>Scirpus subterminalis</i>)	1	12	Riparian	Occurs in open water and bog margins of ponds, lakes, sloughs at 0.0 to 3 meters depth in valley, foothill and montane zones

a narrow geographic range and/or special microhabitats. Habitats supporting sensitive plant species have been classified into four broad categories: alpine, meadow, moist forest, and riparian. Table 3-4 shows occurrence information and habitat requirements for each sensitive species known to occur in the study area.

Environmental Effects

A risk analysis was used to identify potential effects to Wildlife and Sensitive Plants. This analysis, in Appendix E, is the basis for the effects discussed below.

In general, for a mineral withdrawal analysis where there is no site-specific development proposal, there is insufficient data to make a determination of effects. On federal lands, sensitive plant surveys are completed before surface disturbing activities occur. Impacts to sensitive plants can often be mitigated by relocating surface disturbing activities. Sensitive or rare plant species usually occur in small isolated populations and often occupy specialized niches. Maintaining the viability of sensitive species requires protecting the known populations and sites or habitats they are capable of occupying under colonization. Ground disturbance and alterations in light, moisture, and nutrient regimes within forest and grasslands can affect sensitive plants and their habitats. These effects can take two forms: either the actual destruction of individuals in a population, or the adverse modification of indicator habitat considered critical to the maintenance of viable populations.

Population size, associated habitat and topography along with the intensity, duration and timing of proposed activities are considered in determining effects to sensitive plants. On federal lands, site-specific impacts and population avoidance would be considered on a site-specific basis at the time a proposal was made for ground disturbing activities.

SCENERY, RECREATION, AND ROADLESS

This section addresses concerns about visual, recreation, and roadless resources of the Rocky Mountain Front. Each resource area discussion has the following sections: Management Direction, Affected Environment, Mining Activities That Could Affect, Effects of Alternative A, Effects of Alternative B, and Forest Plan Consistency. Table 3-5 shows how effects to each of the resources in this section are addressed.

TABLE 3-5: INDICATORS AND COMPARATIVE MEASURES

AFFECTED RESOURCE	MEASUREMENT INDICATOR	COMPARATIVE MEASURE
Scenery	Changes in scenery settings	Scenic Integrity Levels
Recreation opportunity and experience	Changes in recreation settings, visitation, and activities	Recreation Opportunity Spectrum Recreation Settings Recreation Activities
Roadless areas	Roadless character	Natural Integrity Apparent Naturalness Remoteness Opportunity for Solitude Unique Features Manageability

VISUAL RESOURCES (Scenery)



Photo: Ear Mountain – Rocky Mountain Front

This section discusses and displays the visual characteristics of the study area.

Management Direction

The analysis for the study area employs the Visual Management System developed by the U.S. Forest Service. The *Landscape Aesthetics - A Handbook for Scenery Management Number 701* (USDA 1996) was used to evaluate the visual resource. This system replaces *The Visual Management System – Handbook Number 462* (USDA 1974). This new system provides for the evaluation of physical features of the landscape called "scenic attractiveness classes" (formerly "variety classes") together with the levels of concern people have for scenery (formerly "sensitivity levels"). This information is synthesized to develop "Scenic Integrity Levels" (SILs), formerly referred to as visual quality objectives (VQOs).

The Lewis & Clark and Helena National Forest Plans established Scenic Integrity Levels (formerly VQOs) for each Management Area. The proposed actions are within a variety of management areas. Table (3-6) describes the Scenic Integrity Levels established in the Plans. The guidelines for meeting these levels are explained the glossary.

TABLE 3-6: SCENIC INTEGRITY LEVELS FOR MANAGEMENT AREAS

VQOs - Scenic Integrity Levels	Description
Retention - High	Refers to landscapes where the valued landscape character "appears" intact. Deviations may be present but must repeat form, line, color, texture and pattern common to the character so completely that they are not evident.
Partial Retention - Moderate	Refers to landscapes where the valued landscape characters "appears slightly altered." Noticeable deviations must remain visually subordinate to the landscape character being viewed.
Modification - Low	Refers to landscapes where the valued landscape characters "appears moderately altered." Deviations begin to dominate the valued landscape character being viewed, but they borrow valued attributes such as size, shape, edge effect, and pattern of natural openings, vegetative type changes outside the viewed landscape. They should be compatible or complementary to the landscape character.
Maximum Modification - Very Low	Scenic Integrity "appears heavily altered". Deviations may strongly dominate the landscape character. They may not be appropriate in shape, edge effect, or patterns. However, deviations must be shaped and blended with landforms so that elements such as unnatural edges or landings do not dominate the composition.

Scenic Integrity Levels

The Helena and Lewis & Clark Forest Plans prescribe scenery levels for each Management Area within the study area. SILs for the study area are shown in Table 3-7. Map 3-4, with Forest Plan Management Areas, shows these SIL locations.

TABLE 3-7: SCENIC INTEGRITY LEVELS

Helena NF Management Areas	Management Emphasis	Scenery Integrity Levels
MA L -1	Livestock	Very Low
MA L -2	Livestock & Winter Range	Low
MA M -1	Minimum Management	High
MA N - 1	Research Natural Area	High
MA R -1	Semi-primitive & Primitive Non-Motorized Recreation	High
MA W -1	Wildlife	Moderate
MA W -2	Wildlife & Livestock	Moderate

TABLE 3-7: SCENIC INTEGRITY LEVELS (continued)

Lewis & Clark NF Management Areas	Management Emphasis	Scenery Integrity Levels
MA - E	Livestock & Winter Range	Moderate
MA - F	Semi-primitive Recreation	High to Moderate
MA - G	Minimum Management	High to Moderate
MA - H	Developed Recreation	High to Moderate
MA - I	Wildlife	High to Moderate
MA - N	Rare II Study Area	High to Moderate
MA - M	Research Natural Area	High
MA - O	Timber & Livestock	Moderate to Low
MA - Q	Recommended Wilderness	High
MA - R	Riparian Areas	High to Low

Affected Environment

The majority of the Rocky Mountain Front study area (the Front) is administered by the Rocky Mountain Ranger District, Lewis & Clark National Forest. The Front landscape serves as the visual backdrop for recreationists accessing the well-known Bob Marshall Wilderness Area.

The southern portion of the study area is located on the Lincoln Ranger District of the Helena National Forest. The study area is visible from a variety of viewpoints, which include but are not limited to Highway 89 (from Dupuyer to Choteau), Highway 287 (from Choteau to Augusta) Highway 200 (southwest of Great Falls) and numerous Forest or county roads that access National Forest and Wilderness trail heads. Rocky Mountain District 1997 records show approximately 58,000 visitors to the Bob Marshall Wilderness.

Landscape Character

"The landscape character is an overall visual and cultural impressions of landscape attributes – the physical appearance and cultural context of a landscape that gives it an identity and "sense of place" (Landscape Aesthetics - A Handbook for Scenery Management - USDA Forest Service Handbook #701).

The Rocky Mountain Front Range is part of the Columbia Rockies Landscape character type within the Rocky Mountain geographic region as described in *Visual Character Types and Variety Class Description*, (USDA 1980).

The Columbia Rockies landscape type includes most of the Flathead and Kootenai National Forests, the Rocky Mountain Division of the Lewis & Clark, the western half of the Lolo and Bitterroot National Forests, and the eastern portions of the Idaho Panhandle, Clearwater and Nez Perce National Forests.

Sub-regions of landscape character types are geographic areas that have similar visual characteristics of land and rock forms, vegetation, and water forms. Together, these features combine to create visual images. Deep canyons, cirques, large uplifting rocky topography, strongly contrasting vegetation and cascading rivers and streams characterize this outstanding scenery.

The study area consists primarily of undeveloped, unroaded landscapes. The impacts of man's

activities are typically minimal. The visual evidence of human related activities is primarily limited to road dependent activities such as logging, developed recreation sites, utility corridors, reservoirs or special use cabins.

The linear north-south orientation of the ridges and foothills, together with frequent unobstructed views from the Great Plains create spectacular views of the Rocky Mountain Front. Mountainous peaks and geologic features rise dramatically from the plains elevations up to nearly 9,000 feet in elevation. Views of much of the Rocky Mountain Front are possible at one time. Highways and county and reservation roads, together with numerous well-used fishing lakes, provide viewpoints to the east of the "Front" from which most off-forest views occur.

Major geologic features such as rock ledges, vertical rock cliffs, bluffs and rock outcrops tend to dominate the scenery of this unique landscape. Scattered and dispersed patterns of vegetation in the foreground lead the eye to more dense uniform patterns and colors of evergreens in the middle and background horizons. The evidence of man's activities are subtle to the mid and background viewers. This area depicts a natural appearing landscape; many would consider it to be of wilderness character with vast untouched areas of high integrity and immense scale. This landscape is unique among lands administered by the Forest Service, with the exception of areas set aside as wilderness.

Historical and Existing Conditions

The area has been subject to natural fires throughout history. Fire records indicate that in the last century much of this landscape burned in a series of large stand replacing wildfires. Over time, these areas have again become densely forested with a dominance of lodgepole pine, limber pine and Douglas fir. Two large stand replacing fires in 1988 burned in the study area. Fire patterns are evident to the casual observer. Significant floods of 1964 and 1975 created scouring and some major changes to the appearance of many of the drainages in the area.

Timber harvesting and road building over the last twenty to thirty years has altered the landscape. The effects of timber harvesting meet the scenery intent of the Forest Plans.

Scenic Attractiveness

The Scenic Attractiveness Class of the study area is rated as distinctive to the National Forest system and the character of Montana. This combination of geologic features and scale of landscape is unique to Montana. Based on review of principle information listed in the Forest Plans and public comments, the concern or sensitivity level for the scenery is rated as high to very high

Table 3-8 summarizes the existing conditions for the study area.

Viewing Locations

For this analysis, numerous potential viewing locations were considered. Three viewpoints were chosen to represent the spectrum of area views. See Viewpoint Map 3-6 for viewpoint locations. These viewpoints are the basis for the analysis. Table 3-9 lists the viewpoints, which are described in detail later in this section.

Viewpoint Descriptions

Viewpoints used for this analysis were selected based on the number of viewers, their sensitivity and opportunities for viewing the study area. The following describes the critical viewpoints that will

be used for analysis of the effects of proposed management activities on the scenery of the area.

TABLE 3-8: EXISTING VISUAL CONDITIONS

Existing Visual Condition (EVC) Rating	Locations
Unaltered or Appears Unaltered	Higher elevations (5,000' plus) of the study area including wilderness
Moderately Altered	National Forest lands between the wilderness area and forest boundaries.

TABLE 3-9: VIEWPOINTS

Viewpoint #	Locations
1	Near Basin Lake on Highway #287 (16 miles south of Choteau)
2	Forest Access road #235 near Nilan Reservoir
3	Alice Creek Road on the Helena NF



VIEWPOINT #1 - Existing Conditions view from Highway #287 near Basin Lake

Viewpoint #1 is located 16 miles south of Choteau on Highway #287. Unobstructed middle ground and background views of the study area are visible from this location, which offers views of the Sawtooth Ridge on the south to Castle Reef on the North. The area is on tangent view from this location, meaning that the landscape is in a direct line of sight for travelers on the county road shown in the previous picture. Rimrock features of Sun Canyon dominate many of the study area east side viewpoints. Similar views are available from the towns of Augusta, and the general area. A vehicle counter placed on Highway 287 in this area

showed approximately 400 vehicles per day in 1998.

The existing vegetation, seen from this location, is described as scattered groups of trees in the lower elevation leading up to dense stands of even-aged, primarily mature lodgepole pine.

From this viewpoint, management activities such as timber harvesting, road construction or mining activities are not evident. The existing landscape condition meets Forest Plan scenery guidelines.



VIEWPOINT #2 - Existing Conditions view from Forest Access Road #235 at Nilan Reservoir

Viewpoint #2 represents the general view of the study area as seen from a closer distance than viewpoint #1. Nilan Reservoir is a popular recreation site on the way to the study area. McCarty Hill, Sugar Loaf and Sawtooth Mountain form the backdrop for this frequently visited location.

Snowfields, rocky areas and brush fields create interesting patterns on the upper elevations of the

area. The majority of dense overstory vegetation seen from this location is composed of uniform, even-aged lodgepole pine stands along with scattered stands of limber pine and Douglas fir. Logging activities over the past twenty to thirty years have created patterns and changes in the dense textured forests. Those changes are not evident from this viewpoint. The existing landscape condition meets Forest Plan scenery guidelines.



VIEWPOINT #3 – Existing conditions view from Alice Creek Road on the Helena NF

Viewpoint #3 represents the southern portion of the study area in the Alice Creek drainage on the Helena National Forest. The Alice Creek Road intersects Highway 200 about 10 miles east of Lincoln. Alice Creek is popular year-round. Hunting and snowmobiling are major recreation activities in the area.

Forests of mature Douglas fir and Ponderosa Pine trees form interesting patterns on the rolling and undulating landscape. Logging and mining activities are part of the landscape history. Mixed ownership patterns also influence this landscape. Existing conditions meets Forest Plan scenery guidelines.

Other viewpoints

Other viewpoints are available, both inside and outside the study area. Viewpoints are selected based on their proximity to the study area, their location in relation to the Bob Marshall and Scapegoat Wilderness areas, or recreation use. The relative elevation and terrain between a viewpoint and mine related activities are primary determinants of visibility. Other viewpoints for the study area are shown in Table 3-10. Two of these are pictured below and the project file contains other photos showing existing conditions.



View from Haystack Butte – photo by Ralph Waldt



View from Ear Mountain – photo by Ralph Waldt

TABLE 3-10: OTHER VIEWPOINTS

Viewpoint	Location	Recreational Use	Types of Access	Level of Use
Haystack Butte	9 miles SW of Augusta	Hiking, Sightseeing	Pedestrian	Low
Castle Reef	19 miles NW of Augusta	Hiking, Sightseeing	Pedestrian	Low
Ear Mountain	23 mi. west Choteau	Hiking, Sightseeing	Pedestrian	Low
Headquarters Pass	South Fork Teton	Hiking, Horse packing	Pedestrian, Horse	Moderate

Environmental Effects

A risk analysis was used to identify potential effects to Scenery. This analysis, in Appendix E, is the basis for the effects discussed below.

Mining-Related Activities That Could Affect Scenery

Activities that have the potential to affect the scenic resources are those that disturb vegetation, soil or land form by processes not normally found in nature. Activities on a scale that create unnatural appearing features would not meet the various Scenic Integrity Levels.

Assessment of effects to scenery resources is difficult because of the subjective nature of viewing scenery. People are attracted to an area because of the setting and the types of recreation opportunities. Some users are tourists who may be visiting an area only once or twice in their lifetime. Others repeat visits to the same area and develop patterns that become part of their lifestyle, regardless of the distance from their home. Changes may discourage or displace users if that change is dominating enough to affect the setting or to negatively affect views of a particular landscape. Sources of potential effects include:

- construction of roads
- construction of mining facilities
- earth moving
- mining related noise, lighting, or traffic
- increased use due to increases in the local population

The duration of these effects would relate directly to the severity of effects.

Potential Activities

Mineral prospecting activities could include:

- surveying for minerals by digging for soil samples
- use of instruments that fall within the normal levels of mechanization for the area of prospecting
- claim staking may also be involved if prospecting reveals promising mineralization

Mineral Exploration activities could include:

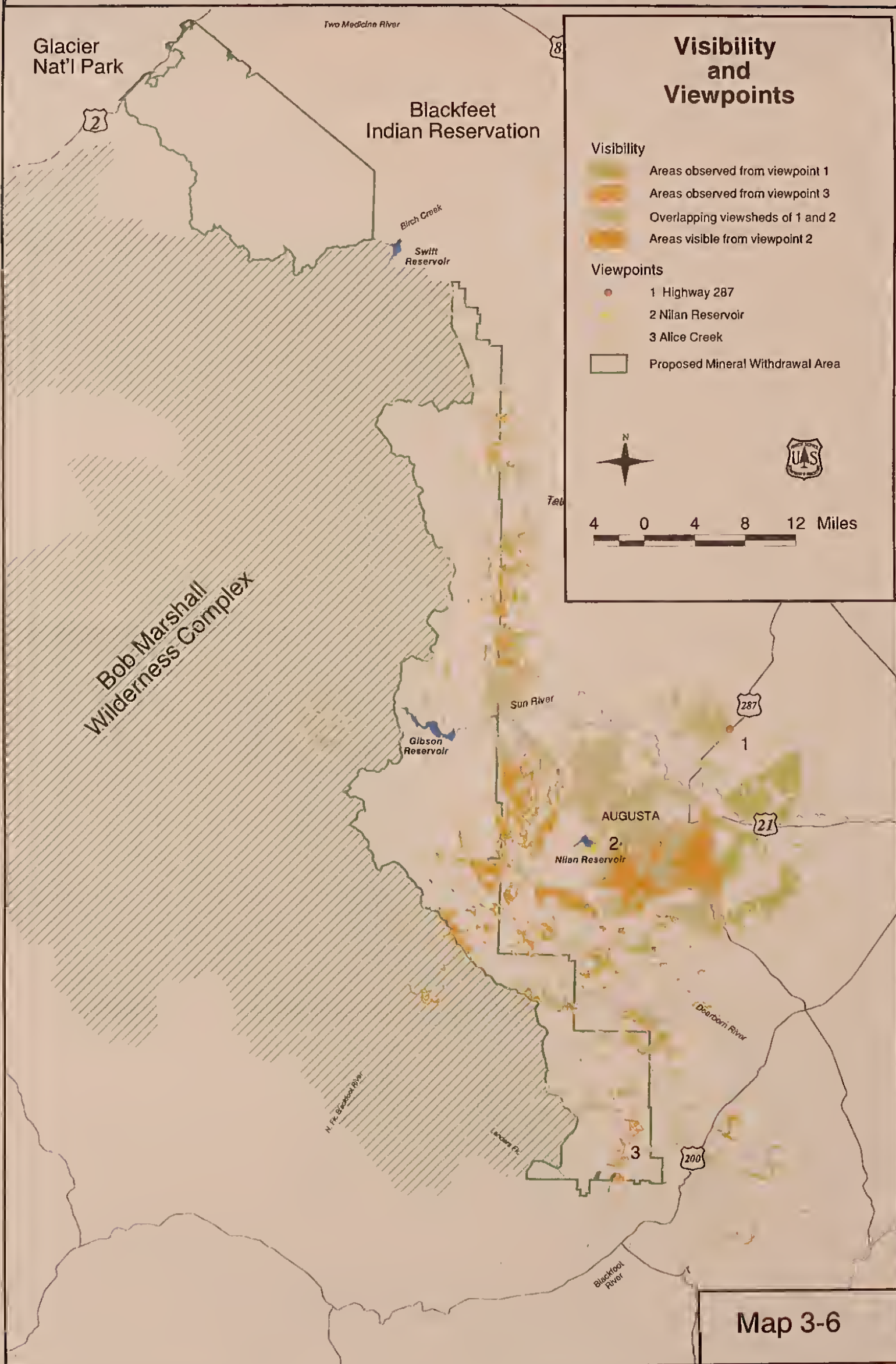
- drilling with truck-mounted or platform equipment
- surface soil stripping, and any method normally used to explore for minerals
- new roads may be needed for transport of equipment in motorized areas

Mitigation measures may include use of helicopters or other technology to reduce road access to some sites. Soil disturbance and removal of vegetation would be likely to have the greatest long-term effects.

Effects of Alternative A

Under Alternative A, approximately 405,000 acres of federal land would remain available for mineral entry. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes that a geological mapping and geochemical and geophysical surveying program would take place once every ten years. Exploration by drilling is expected 5 times in 100 years. The probability of detailed drilling and development is much less (0.1%). These activities will not be covered in the effects discussion because their probability of occurrence is so low.

Proposed Rocky Mountain Front
Mineral Withdrawal
Lewis and Clark and Helena National Forests



Map 3-6



Direct Effects - If the no action alternative were implemented it is very likely that the effects to scenery and settings along the Rocky Mountain Front would be negligible to low within the next 20 years. Moderate effects would be less likely and the probability of high or extreme effects is nearly nonexistent.

Prospecting has only occurred every 10 years historically along the Front. The consequences of prospecting, should it occur twice or in two areas within the next 20 years, would be negligible in the areas of Roaded Natural and Semi-Primitive Motorized ROS. There could be some negative effects on viewing scenery experiences in the Semi-Primitive Non-motorized or in Primitive ROS areas, though these effects would be minor and of short duration. Those minor effects, or low consequences, would be very small ground disturbances, usually not noticeable as unnatural. Examples are: soil pits, flagging and monuments. The number of people affected would be small or nonexistent; there is a high likelihood, particularly in remote areas, that recreationists and prospectors would not encounter each other.

Exploration activities are expected to occur once somewhere on the Rocky Mountain Front in the next 20 years and would have greater consequences than prospecting. Consequences in Roaded Natural settings would be low because small disturbances and motorized noise are expected there. In Semi-Primitive Motorized or Non-Motorized or in Primitive settings, the consequences could be moderate, depending on type of exploration. Exploration may simply include a few drilled test holes along existing routes or may include test holes in more remote areas. The proximity to roads and trails, the method of access to the area and the type of exploration involved are all factors that, combined with location, would determine the severity of effects. Ground disturbing long term changes resulting from exploration would be limited in size and intensity by mitigation requirements appropriate to the setting. People viewing scenery in an area claimed for mining could be displaced. Changes in the setting from exploration could also affect users and their activities by reducing the natural appearance with soil disturbance and equipment at or near their favorite sites.

Changes to developed recreation and administrative sites are likely to be minor due to the small amount of total area. Several

administrative sites (Elk Creek Ranger Station (RS), Ear Mountain Administrative Site, Blackleaf RS, North Dupuyer RS, Willow Creek RS, Beaver Creek RS, and Palmer Flat RS) are already withdrawn from mineral entry and therefore will not be affected. The Benchmark Recreation Area, Wood Lake Campground and the Gibson Reclamation Withdrawal Area are also already withdrawn and would not be affected. A list of areas and acres currently withdrawn from mineral activity are included in Appendix G.

All remaining developed recreation sites (campgrounds, trailheads, boat launches), special use permitted cabins and resorts and administrative sites would remain available for mining-related activities. The effects of activities to these areas are similar to the surrounding lands. More recreationists could be affected if prospecting or exploration occurred in these areas because people are more concentrated in developed sites compared to dispersed sites. Locating exploration activities away from developed areas could mitigate these effects.

Dispersed sites would be the most difficult to shield from effects because activities could occur in almost any location, but infrequently in most locations. Wherever the exploration occurs, the landscape would be changed and users may be displaced temporarily, if not permanently. Known dispersed sites and outfitter camps could be protected to some degree with mitigation.

Recreationists using the Wilderness may, in the unlikely event of exploration nearby, see drilling machines or other equipment instead of a primitive setting. Mitigation measures, such as locating equipment well away from trails and ridgelines, would be required to minimize these effects.

Glacier National Park lies adjacent to the study area. Montana State Highway 2 separates them. Hikers and recreationists may have the potential to view a drill rig from ridges above Highway 2. Considering the viewing distance and tree screening, the effects to views from Glacier National Park would be minor.

Indirect Effects - If exploration were sufficient to displace recreationists, they would probably move elsewhere on the Front. This could include the Bob Marshall Wilderness Complex (BMWC) for nonmotorized activities. It is unlikely that effects of displacing users would even be noticeable to other

users or managers. Even if exploration activities were extensive enough to change to the landscape from the valley viewpoints, use and traffic patterns would not change.

Cumulative Effects - Few and limited effects are expected with this alternative. In the event that mining-related activities do occur, those effects would be added to other changes that could result from management decisions in travel planning, land use designations or other resource considerations. A steady increase in recreation use, particularly the trend of more dispersed use, would also contribute to cumulative effects.

Effects of Alternative B

Under Alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes no other locatable mineral activities would take place.

Direct, Indirect, and Cumulative effects - If the proposed action were implemented there would be no changes in scenery settings, opportunities or activities resulting from mineral prospecting, exploration or development in the next 20 years. Changes to the scenery may still occur resulting from natural occurring changes such as fires, floods or insect and disease outbreaks. Changes could also result from management decisions on travel planning, new land use designations or from other resource considerations.

Consistency of Alternatives with Forest Plan Direction

Both alternatives are consistent with scenery direction from Lewis & Clark and the Helena Forest Plans. The withdrawal could possibly facilitate maintaining the primitive and semi-primitive settings designated in the Forest Plans.

RECREATION

Introduction

Outdoor recreation use can be divided into two broad categories: developed recreation and

dispersed recreation. Developed recreation includes activities occurring at areas specifically designed and designated for use, such as special use cabins and lodges, winter sports areas, campgrounds, trailheads and picnic areas. Dispersed recreation includes activities that occur outside of these areas, such as pleasure driving, trail riding or hiking, roadside or back country camping, fishing, hunting, cross country skiing and many other activities.

The Lewis & Clark Forest Plan projected an increase in developed recreation use from 198,500 to 230,100 recreation visitor days (RVDs) by the year 2030. Dispersed recreation use is expected to double by 2030 to about 1.5 million RVDs annually. As of 1994, Forest developed recreation use was estimated at 301,000 RVDs, not including special use permitted ski areas, cabins and resorts. There were 648,000 RVDs of dispersed recreation use in 1994. These are estimates only, based upon a mixture of observations, hunting data from the State, road counter data, fee collection data, and trend data from other agencies. They indicate that dispersed use trends are in agreement with Forest Plan projections, while developed recreation has surpassed projections by about 50%.

Management Direction

The Lewis & Clark and Forest Helena Forest Plans provide direction for recreation management. Both documents provide specific management direction for each management area and both leave some travel decisions open for the travel planning process, which in turn affects recreation opportunities. The Recreation Opportunity Spectrum (ROS) provides additional guidance to categorize and compare recreation opportunities and settings.

The Lewis & Clark Forest Plan provides forest-wide management standards for recreation on pages 2-25 and 2-26. These standards direct the management of recreation information, campgrounds, roads and trails, recreation residences and winter recreation. Specific management area direction defines the recreation setting, or ROS, and provides travel-planning guidance. Table 3-11 summarizes direction by management area. Management Area locations are shown on Map 3-4.

TABLE 3-11: LEWIS & CLARK FOREST PLAN DIRECTION FOR RECREATION

Management Area	Lewis & Clark Forest Plan – Management Area Direction
E, O	Roaded Natural setting with dispersed use; travel management varies. Construction of recreation facilities and special uses allowed if consistent with wildlife goals.
F, G & I	Semi-primitive setting with dispersed use; travel management varies. Construction of recreation facilities and special uses allowed if consistent with wildlife goals.
H	Roaded Natural setting with developed campgrounds and other facilities. Manage to maintain, improve or expand facilities and administer special use permits.
M	Semi-primitive setting with dispersed use with consideration for research area values; travel management varies.
N	Semi-primitive setting; manage dispersed use to protect wilderness values.
Q	Primitive setting; manage dispersed use to protect wilderness values.
R	Riparian MA will be managed to meet adjacent recreation settings.

The Helena Forest Plan provides forest-wide management standards for recreation on pages II-14 and II-15. These standards emphasize maintenance of existing recreation facilities and services, and providing dispersed recreation opportunities, and additional visitor information.

Helena Forest management area direction, for the study area, encourages a variety of motorized and non-motorized dispersed recreation. Table 3-12 summarizes this direction. The Management Area locations are shown on Map 3-4.

TABLE 3-12: HELENA FOREST PLAN DIRECTION FOR RECREATION

Management Area	Helena Forest Plan – Management Area Direction
L - 1	Motorized and non-motorized dispersed recreation encouraged. Trailhead and trail facilities will be maintained or constructed as needed.
M - 1 & N - 1	Constructed trails and trailhead facilities may support dispersed recreation.
L - 2	Motorized access will be prohibited or be limited to designated routes December 1 to May 15. Non-motorized dispersed may be supported by trail and trailhead construction.
R - 1	No motorized recreation; facilities are maintained and constructed as needed.
W - 1 & W - 2	Controls over motorized use will be based on protecting wildlife habitat. Construction of trail and trailhead facilities is allowed.

ROS Classifications

The Recreation Opportunity Spectrum (ROS) is a system for classifying recreation settings and opportunities. ROS offers a framework for understanding the level of development and access, the remoteness, naturalness, social setting, and visitor management of the Forests (USDA Forest Service 1986). It is also a tool for comparing changes in recreation opportunities under various management scenarios. ROS

assumes that recreation experiences are dependent on the setting in which they occur; that people prefer certain settings for certain activities. Some experiences require remote areas devoid of human presence or impacts. Others are most compatible with easily accessible areas and highly developed facilities offering comfort, security and social opportunities. ROS mapping was updated for the Helena Forest in 1999, and for the Lewis & Clark Forest in 1994.

A premise of ROS is that it is important to provide a broad spectrum of recreation opportunities within the National Forest System. Acknowledging the need to provide a spectrum of recreation settings, ROS has been divided into six major classes and one subclass for Forest Service use. The four classes and one subclass within the study area are: Roaded Natural with Roaded Modified as a subclass, Semi Primitive Motorized, Semi-Primitive Non-Motorized, and Primitive. Rural and Urban are two major classes, which are not found in the area. Another ROS variable is season. Opportunities for motorized use change from summer to winter. Snowmobiling is allowed in some areas that do not permit motorized use in summer. Some roads are unusable by autos in winter due to deep snow or closed for other reasons. ROS classes, therefore, are inventoried separately for each season. The ROS classes are defined in the glossary and summarized for the project area in Table 3-13.

Affected Environment

The study area is within the Northern Rockies Subregion, which is part of the Northern Recreation Region (USDA Forest Service 1993). This subregion surrounds Glacier National Park and Bob Marshall Wilderness Complex (BMWC). The following assets characterize it:

- Home of one of the largest intact ecosystems in North America
- Diverse wildlife populations and breathtaking scenic beauty
- Large acreages of primitive and semi-primitive recreation opportunities
- Significant international tourism to the area

Recreation Settings and Activities

Wildland recreation activities in the study area are diverse. Local knowledge, from Forest Service professionals working in the area, user surveys (Yates 1991), ROS inventory and GIS technology are the primary sources of information about opportunities and activities within the study area. The majority of recreation use occurs during summer and fall. Because of the undeveloped character and sense of remoteness, ROS classes are primarily Semi-primitive or Primitive. Maps 3-7 and 3-8 show ROS class locations for summer and winter. Table 3-13 shows acres and percent of the study area in each class, by season.

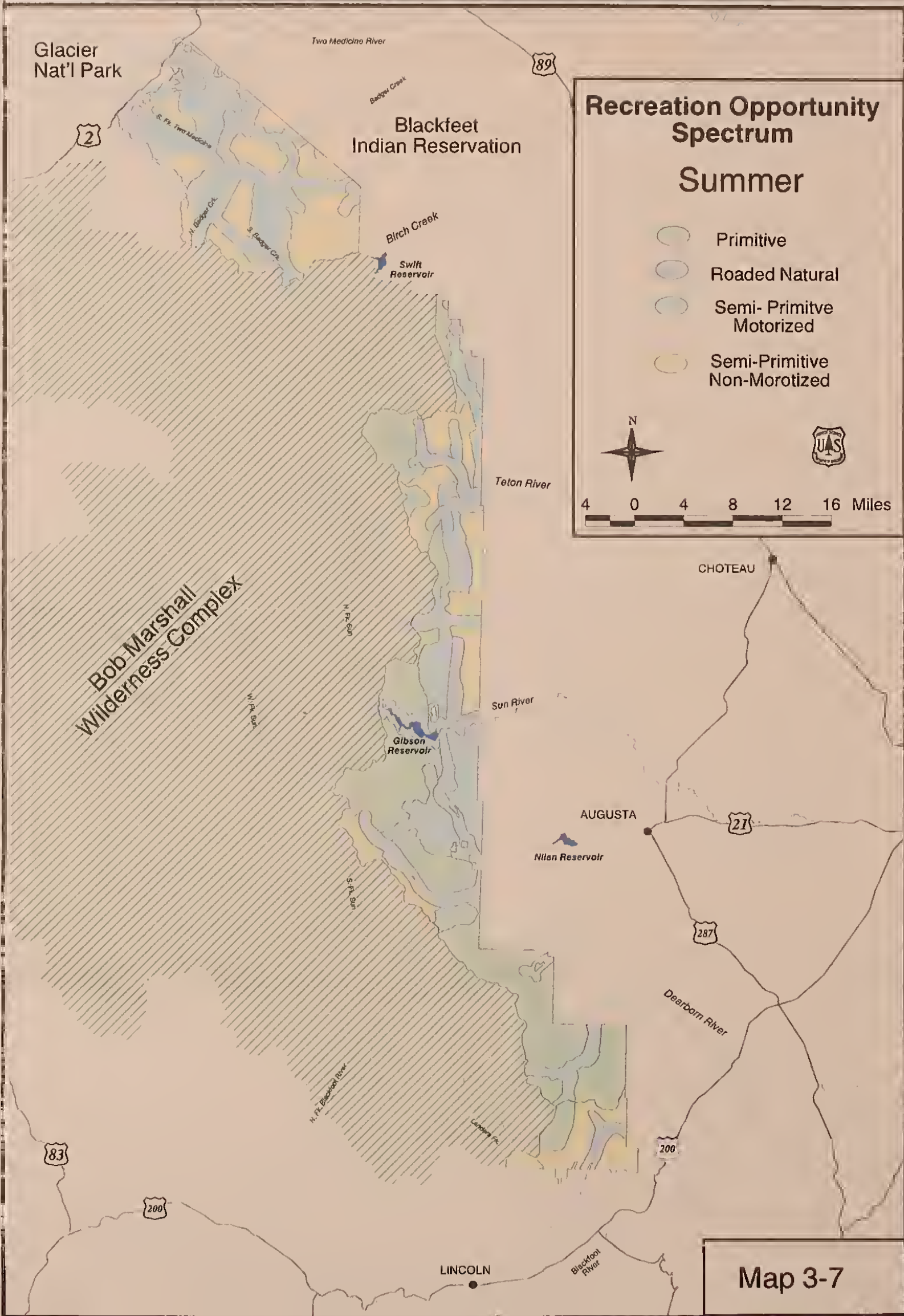
The area is noted for its spectacular beauty and outstanding dispersed recreation opportunities in Semi-Primitive and Primitive ROS classes. The undeveloped recreation opportunities and the area's proximity to the Bob Marshall Wilderness Complex and Glacier National Park draw visitors from across the state and the nation. The area's remoteness, wildness, scenic beauty and spiritual values have resulted in a very significant core of recreationists and other users with strong, emotional attachment to the area and its existing character.

In the 1991 recreation survey (Yates 1991), 36% of the respondents (41 individuals) indicated that, out of all the mountain ranges on the Lewis & Clark Forest, the Rocky Mountain Front was the most important to their recreation experiences. Those who favored this mountain range were asked to note all their outdoor recreation activities.

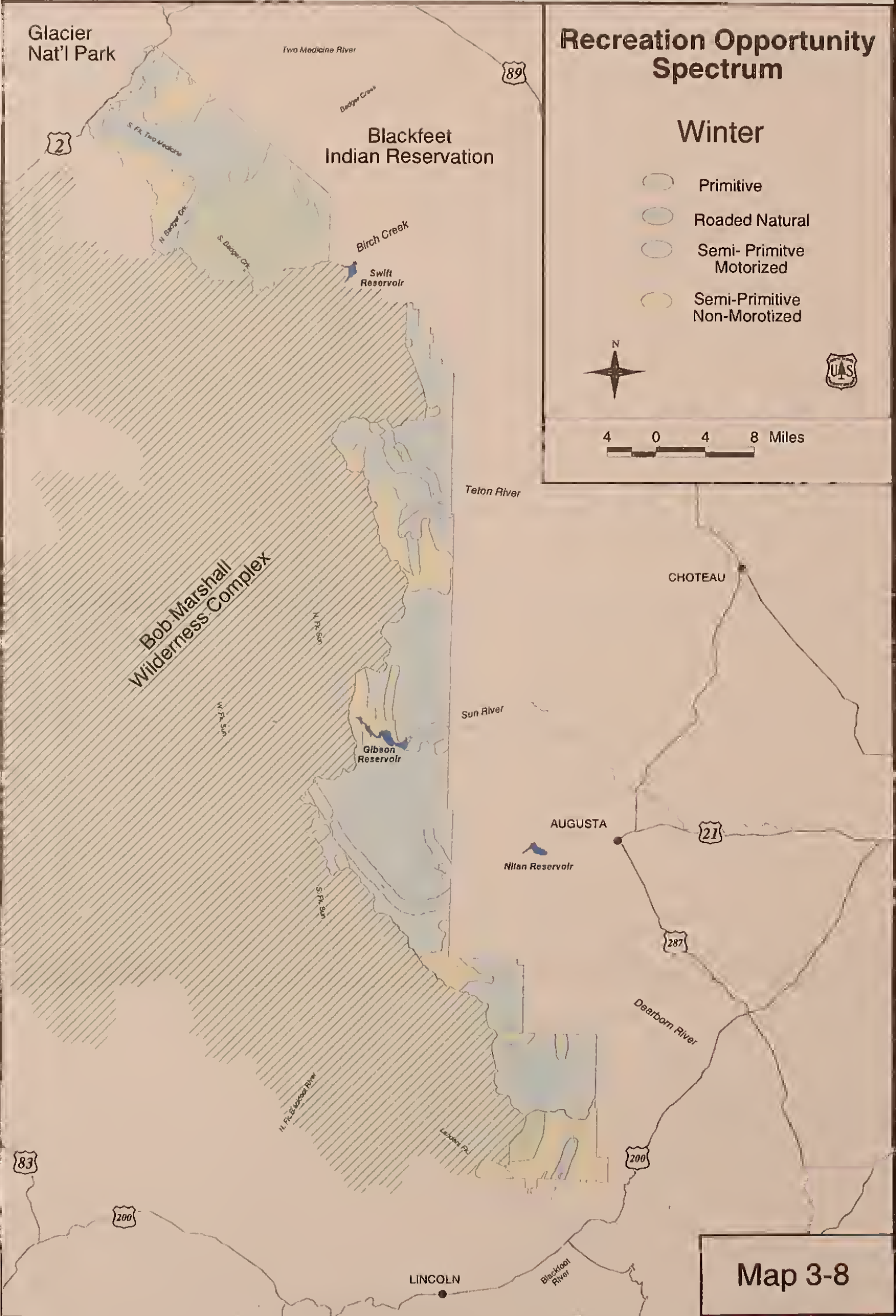
TABLE 3-13: RECREATION OPPORTUNITY CLASS AND AREA BY SEASON

ROS Class	Description	Summer %	Winter %
Primitive (P)	Most areas are within Forest Plan Recommended Wilderness, adjacent to BMWC and at least 3 miles from motorized use.	28	15
Semi-primitive Non-motorized (SPNM)	All areas are within Inventoried Roadless and at least ½ but not more than 3 miles from motorized roads and trails.	25	6
Semi-primitive Motorized (SPM)	Most areas are within Inventoried Roadless areas, have motorized trails and primitive roads and are at least ½ mile from system roads.	32	59
Roaded Natural (RN)	Areas within ½ mile of main two-wheel drive roads and around campgrounds, trailheads and other developed sites and administrative facilities.	15	20

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Map 3-8

Activities listed most were: fishing, picnicking, hunting, auto/RV camping, viewing wildlife, viewing scenery, driving for pleasure, collecting firewood, day hiking, photography, Christmas tree cutting, backpacking, back country camping, horseback riding, 4-wheel driving, ATV riding, motor biking, skiing/snowboarding, and snowmobiling.

Developed Recreation

The Lewis & Clark Forest has 7 fee campgrounds and 19 other developed recreation sites including: trailheads, a picnic area at Wood Lake and several non-fee campgrounds, within the study area. The Helena Forest has the Alice Creek trailhead within the study area and the Indian Meadows trailhead just outside the study area boundary. The Teton Pass Ski Area provides the only downhill ski facility on the Front. Private interests have 103 special use permitted recreation cabins and four special used permitted resorts on the Lewis & Clark Forest. The Summit Highway Rest Area/Roosevelt Monument Square at Marias Pass is the most frequently visited recreation facility in the study area. This facility and Summit Campground are the only facilities along a state highway.

Existing roads into this area are very limited, with about 115 miles of Forest system roads. Almost all recreationists must use this limited road system for initial access to the area. Fully half of the users of the Front surveyed (Yates 1991) drive forest roads for pleasure. Road-related recreation also includes picnicking, auto/RV camping, viewing wildlife and scenery, photography and collecting firewood.

Trails

A total of 585 miles of trails provide the primary means of off-road access into the area. Thirty-nine percent of the trails are non-motorized, forty percent allow motorized use part of the year and twenty-one percent allow motorized use all year long. Within the trail system is the Continental Divide National Scenic Trail (CDNST) #440 and national recreation trails including:

Trail No.	155	Jones Creek
Trail No.	156	West Fork Jones Creek
Trail No.	168	South Fork Teton
Trail No.	223	Blacktail Creek
Trail No.	232	Petty Crown
Trail No.	244	Petty Ford Creek
Trail No.	270	Crown Mountain
Trail No.	420	Silver King

Trail No.	438	Landers Fork
Trail No.	477	Lone Mountain
Trail No.	481	Mainline
Trail No.	490	Alice Creek

Lewis & Clark Pass, an important part of the Lewis & Clark National Historic Trail, lies within the Helena portion of the study area and intersects the CDNST.

Wild and Scenic Rivers

There are two rivers with special designation in the study area. They are the North Badger Creek Scenic River Segment and the North Fork Birch Creek Wild River Segment.

Dispersed Sites

Existing dispersed sites typically occur on level spots within about 200 feet of accessible roads and trails in every ROS class. The limited number of roads in the area makes the dispersed sites along them especially important to motoring recreationists.

There are numerous outfitter base camps supporting a significant outfitted recreation clientele. These camps typically have few improvements. Fall hunting season is the busiest time, followed by summer use. Hunting camps are generally set up for the duration of the general hunting season. Summer camp use averages 2-3 nights per trip.

Environmental Effects

Mining Activities That Could Affect Recreation

Assessment of potential effects to recreation resources is difficult because of the subjective nature of the recreation experience and use and levels of use deemed acceptable to various users. People are attracted to an area because of the setting and types of recreation opportunities. Some users are tourists, visiting an area only once or twice in their lifetime. Others repeatedly visit the same area so that area's use becomes a part of their lifestyle regardless of the distance from home. Change may discourage or displace users if that change is strong enough and long term enough to effect the recreation setting or to negatively affect their recreation experience. Sources of potential

effects include the introduction of roads and other mining facilities to the setting, earth moving, mining related noise, lighting and traffic, and increased recreation use due to increases in the local population. The duration of these effects would relate directly to the severity of effects.

Mineral prospecting activities could include surveying for minerals using digging for soil samples and use of some instruments that fall within the normal levels of mechanization for the area of prospecting. Claim staking may also be involved if prospecting reveals promising mineral deposits.

Mineral exploration activities could include varied methods of drilling, surface soil stripping and any method normally used to explore for minerals. Existing or new roads may be constructed to transport equipment in motorized areas. Mitigation measures may include use of helicopters or other technology to reduce road access to some sites. Soil disturbance and removal of vegetation would likely have the greatest long-term effects. Drilling would result in noise increases in the vicinity during exploration.

Effects of Alternative A

Under Alternative A, approximately 405,000 acres of federal land would remain available for mineral entry. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes that a geologic mapping and geochemical and geophysical surveying program would take place once every ten years. Exploration by drilling is expected 5 times in 100 years. The probability of detailed drilling and development is much less (0.1%). These activities will not be covered in the effects discussion because their probability of occurrence is so low.

Direct Effects - If the no action alternative were implemented it is very likely that the effects to recreation activities and settings along the Rocky Mountain Front would be negligible to low within the proposed 20 year mineral withdrawal period, or even much further into the future. Moderate effects would be less likely, and the probability of high or extreme effects is nearly nonexistent.

Prospecting has occurred about every 10 years along the Front. The consequences of prospecting, should it occur twice or in two areas within the next 20 years, would be negligible in the areas of

Roaded Natural and Semi-Primitive Motorized settings. There could be some negative effects on recreation experiences Semi-Primitive Non-motorized or Primitive settings, though these effects would be very small, localized, and of short duration. These minor effects from very small ground disturbances, such as soil pits, flagging and monuments, would have low consequences. Prospecting may result in increased noise, but the noise would be from activities normally allowed within the exploration areas, such as ATV noise in motorized use areas. The number of users and activities affected would be small or nonexistent. It is very likely that recreation users and prospectors would either not encounter each other or would not be using an area at the same time, particularly in remote areas.

Exploration would have greater consequences than prospecting. Consequences in Roaded Natural settings would be low because small disturbances and motorized noise are expected there. In Semi-Primitive Motorized, Non-Motorized or Primitive settings, the consequences could be moderate, depending on type of exploration. Exploration may simply be a few drilled test holes along existing routes or may include test holes in more remote areas. The proximity to roads and trails, the method of access to the area and the type of exploration involved are all factors that, combined with location, would determine the severity of effects. Ground disturbing long-term changes resulting from exploration would be limited in size and intensity by mitigation requirements appropriate to the setting. Recreationists who traditionally use an area claimed for mining could be displaced to other areas if exploration followed the prospecting. During exploration, noise could displace users from as much as an entire drainage. Changes in the setting from exploration could also affect users and their activities by reducing the natural appearance with soil disturbance and equipment at or near their favorite sites.

Developed recreation sites are unlikely to be affected because they occupy small areas. Several administrative sites, Elk Creek RS, Ear Mountain Administrative Site, Blackleaf RS, North Dupuyer RS, Willow Creek RS, Beaver Creek RS and Palmer Flat RS are already withdrawn from mineral entry; therefore, they are not part of the withdrawal and will not be affected. The Benchmark Recreation Area, Wood Lake Campground and Gibson Reclamation Withdrawal Area are also already withdrawn and would not be affected. A list

of areas and acres currently withdrawn from mineral activity are included in Appendix G.

All remaining developed recreation sites (campgrounds, trailheads, boat launches) and special use permitted cabins, resorts and administrative sites would remain available for mining-related activities. The effects of mining-related activities in these areas are no different than in the surrounding lands. However, more recreationists could be affected if prospecting or exploration included any of these areas because users are more concentrated in developed sites than in dispersed sites. If possible, locating exploration sites away from developed areas would mitigate these effects.

National Recreation, Scenic and Historic Trails, other system trails and Wild and Scenic River users could be slightly affected in the unlikely event of exploration activities near these places. Sounds from exploration within the same drainage could degrade experiences where users expect a nonmotorized experience. This effect would last only for the duration of drilling or trenching. The unnatural appearance of the exploration would last longer but could be mitigated by placing the exploration activities out of sight and by revegetation.

Dispersed recreation sites would be the most difficult to shield from effects because activities could occur virtually in all locations, but infrequently in most locations. Wherever the exploration occurred, the landscape would be changed and users may be displaced temporarily or permanently. Known dispersed sites and outfitter camps could be protected to some degree with mitigations.

In the unlikely event of exploration, recreationists using Wilderness may see or hear drilling machines or other equipment instead of their expected primitive experience. Mitigations, such as locating equipment well away from trails and ridgelines could be required to minimize these effects.

Glacier Park lies adjacent to the study area. Montana State Highway 2 separates them. Effects to park recreationists is unlikely beyond the possibility of hikers seeing a drill rig from ridges above Highway 2.

Indirect Effects - If exploration were extensive enough to displace recreationists, they would probably move elsewhere on the Front. This might include the BMWC for nonmotorized activities. It is

unlikely that the effects of displacing users would even be noticeable to other users or managers.

Cumulative Effects - Few and limited effects are expected with this alternative. In the event that mineral activities do occur, those effects would be added to other changes that could result from management decisions in travel planning, land use designations or other resource considerations. A steady increase in recreation use, particularly the trend of more dispersed use, could also contribute to cumulative effects.

Effects of Alternative B

Under Alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes no mines would be developed and no other exploration would take place.

Direct, Indirect, And Cumulative Effects - If the proposed action were implemented there would be no changes in recreation settings, opportunities or activities resulting from mineral prospecting, exploration or development in the next 20 years. Changes to the recreation opportunities, settings and activities may still occur. These would result from natural changes such as fires, floods and insects and disease outbreaks. Changes could also result from management decisions regarding travel planning, land use designations, the trend of increased recreation use or from other resource considerations.

Consistency of Alternatives with Forest Plan Direction

Both alternatives are consistent with Helena and Lewis & Clark Forest Plan recreation direction. The withdrawal could make it easier to maintain primitive and semi primitive settings called for in the Forest Plans.

ROADLESS

The Bob Marshall, Great Bear, Scapegoat Wilderness Complex (BMW) borders the proposed study area on the north and west. Eighty-four percent of the area is within inventoried roadless, some of which has been recommended for Wilderness designation in the Lewis & Clark

Forest Plan. Other portions have been proposed for wilderness designation through the legislative process. Map 3-9 shows inventoried roadless areas within the study area.

Management Direction

Inventoried Roadless

Inventoried roadless refers to National Forest areas that were inventoried as having qualities suitable for preservation as wilderness during the Roadless Area Review and Evaluation (RARE) in 1973, and RARE II in 1979.

Forest Service policy directed Forest Supervisors to address the roadless area issue in the Forest planning process. Forest Plan decisions resulted in recommending additional wilderness, further planning and non-wilderness status for these inventoried roadless lands. All roadless area lands are managed according to Forest Plan standards, guidelines, and the specific management area direction of the roadless area. Most of the roadless areas are within ROS classes: Primitive, Semi-Primitive Non-Motorized or Semi-Primitive Motorized.

The Forest Service established six criteria for evaluating effects on roadless areas. These include natural integrity, apparent naturalness, remoteness, solitude, special features, and manageability and boundaries. These criteria serve as the basis for evaluating effects to roadless areas that may occur with the alternatives considered in this study.

Recommended and Proposed Wilderness

The Wilderness Act directs land management agencies (such as the Forest Service) to protect the natural character of the wilderness and to provide for recreational, scenic, scientific, educational, cultural and historical uses of wilderness. The Wilderness Act defines four required attributes of wilderness, including natural integrity, apparent naturalness, and outstanding opportunities for solitude and opportunities for primitive recreation. In accordance with this Act, the BMWC has been withdrawn from mineral entry.

The Lewis & Clark Forest Plan recommended some inventoried roadless areas for wilderness designation. These areas were assigned a

Management Area Q. Management direction for these areas is the same as for designated Wilderness in many ways, yet it does allow for mineral exploration and development (LCNFP, pg. 3-86).

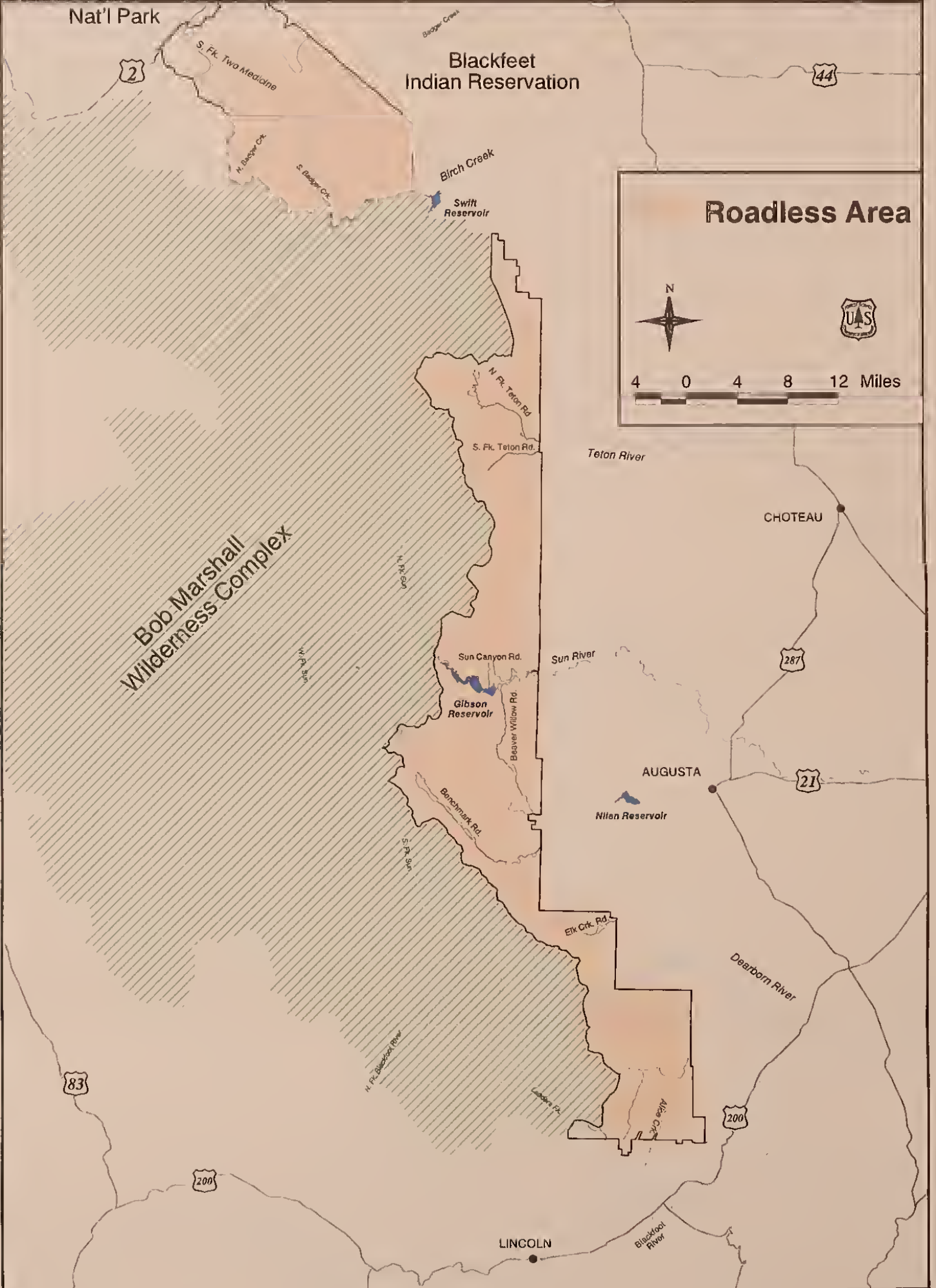
Congress reserves the final decision on wilderness classification. Although numerous wilderness bills involving these areas and additional roadless area along the Rocky Mountain Front have been introduced in Congress, none of the bills have become law. More information about proposed wilderness legislation is included in the project file.

Affected Environment

Most of the study area is considered roadless; areas *not* classified as roadless are the exception. Inventoried roadless areas cover approximately 359,470 acres of the 405,000 acres of federal lands proposed for mineral withdrawal. The inventoried roadless areas and exceptions are shown on Map 3-9. Most of these inventoried roadless areas are part of the Bear-Marshall-Scapegoat roadless area # 01485.

Four areas, totaling 41,834 acres, are recommended for wilderness designation in the Lewis & Clark Forest Plan. These areas are contiguous with the BMWC and within the inventoried roadless portion of the study area. They are listed in Table 3-14 and shown Management Area Map 3-4 as MA-Q. These areas have the four attributes of wilderness. In fact, they are a part of one of the largest intact ecosystems in North America. Natural integrity is high, with vegetation similar to pre-settlement times. There is little evidence of management, other than recreation trails and campsites, yielding the required apparent naturalness, with opportunity for solitude and primitive recreation. Recreation use includes hiking, backpacking, horse riding, animal packing, primitive camping, fishing and hunting. Snowshoeing and cross-country skiing also take place on a very limited basis. These areas are the more remote and most primitive portions of the inventoried roadless within the study area.

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Roadless Area



4 0 4 8 12 Miles

Bob Marshall
Wilderness Complex

CHOTEAU

AUGUSTA

LINCOLN

**TABLE 3-14: LEWIS & CLARK FOREST
PLAN RECOMMENDED WILDERNESS**

Roadless Area Name	Acres
Renshaw	19,144
Silver King-Falls Creek	8,190
Benchmark-Elk Creek	3,630
West Fork Teton	10,870

Environmental Effects

A risk analysis was used to identify potential effects to roadless areas. This analysis, in Appendix E, is the basis for the effects discussed below.

Mining-Related Activities that Could Affect Roadless

Mining-related activities that could affect roadless character are activities that disturb vegetation, soil, or landform by processes not normally found in nature. Activities that change the social setting by bringing more people into the roadless area would diminish remoteness and opportunity for solitude. While activities along the edge of a roadless area could diminish the overall size of a roadless area, the remainder of the area, if large enough, would retain its roadless characteristics. The same activities further within a roadless area would likely have a greater area of influence due to edge affect, thus the roadless character could potentially be lost over a greater area.

Management activities and effects to roadless and recommended wilderness are very similar because the evaluation criteria for the two are similar.

Mineral prospecting activities could include surveying for minerals, digging for soil samples, and using instruments that fall within the normal levels of mechanization for the management area. Claim staking may also be involved if prospecting reveals promising mineralization.

Mineral exploration activities could include varied methods of drilling, surface soil stripping, and any method normally used to explore for minerals. Existing or new roads may be needed for transporting equipment in motorized areas. Mitigation requirements may include use of helicopters or other technology to minimize road construction. Soil disturbance and removal of

vegetation would have the greatest long-term effects. Drilling would result increased noise in the vicinity during exploration.

Effects of Alternative A

Under Alternative A, approximately 405,000 acres of federal land would remain available for mineral entry. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes that a geologic mapping and geochemical and geophysical surveying program would take place once every ten years. Exploration by drilling is expected 5 times in 100 years. The probability of detailed drilling and development is much less (.01%). These activities will not be covered in the effects discussion because their probability of occurrence is so low.

Direct Effects - If the no action alternative were implemented, it is very likely that the effects to roadless character or wilderness potential in Recommended Wilderness areas would be negligible to low within the next 20 years, or even much further into the future. Moderate effects are also possible, depending on location, intensity and scale of mineral activities that might occur. The probability of high or extreme effects is nearly nonexistent.

Prospecting has occurred every 10 years historically along the entire Front. Prospecting twice or in two areas within the next 20 years may or may not occur within roadless areas. There could be small, localized, short duration effects to roadless characteristics. Those minor effects from very small ground disturbances, such as soil pits, flagging and monuments, would have low consequences. Prospecting may result in increased noise, but the noise would be from activities normally allowed within these areas. Prospecting is normally conducted by an individual or very small team and should not change the remoteness or solitude of the location.

Exploration is expected to occur once somewhere on the Rocky Mountain Front in the next 20 years. Exploration would have greater consequences but is less likely to occur than prospecting. In roadless areas, consequences could be moderate, depending on type of exploration. Exploration may simply include a few drilled test holes along existing routes or may include test holes in more remote areas. The proximity to roads and trails, the method of access to the area and the type of

exploration involved are all factors that, combined with location, would determine the severity of effects. Ground disturbing long-term changes from exploration would be limited in size and intensity by mitigation requirements appropriate to the setting.

Recreationists who traditionally use an area claimed for mining could be displaced to other areas if exploration occurs. During exploration, noise could displace users from as much as an entire drainage. The exploration activities and access routes, if developed, could degrade the roadless characteristics of the claimed area. Solitude, remoteness and the other characteristics could be compromised at some activity sites. The consequences of various mining related activities that could affect the six roadless characteristics are shown in Appendix E.

Indirect Effects - Should exploration occur near the BMWC, there is a remote chance that indirect effects could include displacement of users into the wilderness and reduce solitude and remoteness. Exploration near the BMWC could result in increased noise and visible signs of drilling equipment from within the BMWC.

Cumulative Effects - The direct effects discussed above, could have cumulative effects with decisions involving travel planning and management allocations, and with the trend of increased visitation. Natural occurrences, such as fires and floods, are consistent with roadless characteristics and would not be considered cumulative with these effects.

Effects of Alternative B

Under Alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes no mines would be developed and no other exploration would take place.

Direct, Indirect, and Cumulative Effects - If the proposed action were implemented, there would be no change to roadless characteristics resulting from mineral prospecting or exploration in the next 20 years. Changes to roadless character could result from management decisions regarding travel planning, land use designations or from other resource considerations.

Consistency of Alternatives with Forest Plan Direction

Both alternatives are consistent with the Helena and Lewis & Clark Forest Plan direction. The withdrawal could make it easier to maintain the roadless character called for in the Forest Plans.

SOCIOECONOMICS

Introduction

This section presents the social environment and economic community in and around the proposed Rocky Mountain Front Mineral Withdrawal, along with potential effects of the proposed withdrawal

The social environment of an area is defined by a wide variety of factors such as social organization, leadership, lifestyles, values, and expectations. Quality of life is also an important consideration and can encompass the factors above as well as a wide variety of elements such as clean air, clean water, recreational opportunities, area aesthetics, etc. It is influenced the standard of living elements such as economic opportunity and comforts. Impacts on the quality of life and the social environment are generally measured qualitatively. Individual perceptions about the net outcome of potential impacts to them tend to be subjective and personal, depending on values, beliefs, and social structure of the individual or group.

SENSE OF PLACE

It is the physical appearance and cultural context of a landscape that gives it an identity and "sense of place". (*Landscape Aesthetics - A Handbook for Scenery Management - Handbook #701*).

A concern of public land managers is people's personal attachment to certain landscapes and the characteristics that make those landscapes special to them. The Rocky Mountain Front is a special place to many people who use public lands for recreation and or livelihood. It is also highly valued by many who see it in distant views or simply associate it with tales of Bob Marshall and stories by authors such as A.B. Guthrey and Ivan Doig.

Management Direction

From 1995 through 1997, a group of Region One Landscape Architects, Social Scientists, Managers, and Recreation Specialist met. Their charge was to develop a protocol for incorporating *sense of place* into Forest Plans. Parts of the Sense of Place Protocol, finalized in December of 1997, were used to identify sense of place concerns about mineral development and protection of aesthetic values for the Rocky Mountain Front.

Affected Environment

In large part, geologic processes that created the rugged Front topography have also discouraged settlement or development the forested area. This has helped maintain the biological diversity present today. In contrast, the rolling foothills and gentle plains, located to the east of the study area, have experienced rural and agricultural development, which has altered the pre-settlement conditions of those areas.

The National Forest is noted for its spectacular beauty and outstanding dispersed recreation opportunities in Semi-Primitive and Primitive ROS classes. The undeveloped recreation opportunities, and the area's proximity to the Bob Marshall Wilderness Complex and Glacier National Park draw recreationists from across the state and the nation. The area's remoteness, wildness, scenic beauty, and spiritual values have resulted in a very significant core of recreationists and users with strong, emotional attachment to the area and its existing character. The National Forest Lands provide a panoramic backdrop of rugged peaks above the hay and grain fields and broad grasslands with over-thrust buttes, all visible from ranch sites and local valley towns.

The rural setting influences social values in the vicinity. Local land uses and activities are in turn influenced by climate, topography and available natural resources. Some local people relate directly to the extractive use of locally available natural resources, such as agricultural lands, water, minerals, fossil fuels and timber. Others believe that the Front is so valuable for its naturalness, scenery and primitive recreation that it should be used for little else. Most local people, including those involved in extractive uses, have a strong attachment to the aesthetic values and recreation opportunities of this landscape.

Extractive uses are traditionally less common on the Front than on many other public lands. Many long time residents as well as relative newcomers oppose extractive uses of public lands. They feel that other values of the Rocky Mountain Front are more important than the economic opportunities that could result from mineral development or other consumptive resource use. On the other side of the development issue is a core of residents who value local autonomy and continued access to public lands for all traditional natural resource uses (timber, mining, grazing and recreation) contributing to their local economy.

Environmental Effects

Effects of Alternative A

Under Alternative A, approximately 405,000 acres of federal land would remain available for mineral entry. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes that a geologic mapping and geochemical and geophysical surveying program would take place once every ten years. Exploration by drilling is expected 5 times in 100 years. The probability of detailed drilling and development is much less (0.1%). These activities will not be covered in the effects discussion because their probability of occurrence is so low.

Direct, Indirect, and Cumulative Effects - If Alternative A were implemented, whether or not any mineral activities were undertaken, some people would be concerned with the "what ifs" of the continued opportunity for mineral development. The landscape that they hold dear, exactly as it is, could be modified by a large mine somewhere, perhaps even in their most special recreation area or scenic vista. For some people it is too uncertain to maintain the option to place a mine on the Front, especially considering the allowances of current mining laws. The effect of implementing Alternative A would be the perception of a threat to these people's *sense of place*. Many people voiced these concerns.

Most people with an attachment to the Front do not see it as a potential mining area because historically, mining has been very limited there. A mine does not fit their vision of the Front. Some of these same people, as well as others, consider removing opportunities to use any kind of forest products as wrong. For these people, Alternative A best meets their *sense of place* because it most

accurately speaks to their value of using public lands as a source of raw materials and jobs. Not all people who would support this alternative have an attachment to the Rocky Mountain Front.

Effects of Alternative B

Under Alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes no mines would be developed and no other exploration would take place.

Direct, Indirect, and Cumulative Effects - Implementing Alternative B would remove the concern many people have for the potential for mineral development and mining along the Rocky Mountain Front. This alternative provides protection against any risk to their *sense of place* from mining for the next 20 years.

On the other hand, Alternative B negates a feature of these public lands that some people feel should be maintained; the opportunity to search for and develop mineral products as a part of multiple use principles. Alternative B is inconsistent with these people's *sense of place*.

Consistency of Alternatives with Forest Plan Direction

Sense of place protocol was developed after Forest Plans were adopted. There is no Forest Plan direction regarding sense of place, therefore there is no inconsistency with either alternative.

ECONOMICS

Economic issues identified during public involvement centered on employment and revenue to local economies. This economic analysis focuses on four-county study area: Glacier, Lewis and Clark, Pondera and Teton counties, which are the counties with land included in the study area. Specific information about the mining sector is included for each county because of the potential importance of the proposed withdrawal for that sector.

Management Direction

The National Environmental Policy Act of 1969 (NEPA) requires identification and analysis of economic impacts of proposed agency actions.

Affected Environment

Industry Profile

The industry profile section describes earnings, income sectors, and economic trends for the study area. This information is summarized and compared in the Four County Study Area discussion at the end of this section.

GLACIER COUNTY

The majority of the land base of Glacier County is within the Blackfeet Indian Reservation. The western portion of the county is within Glacier National Park. Cut Bank and Browning are the two largest towns in the county. Cut Bank is the county seat. Many of the communities in the western half of the county are supported by tourism and recreation due to their proximity to Glacier National Park.

Earnings by Industry

Earnings of persons employed in Glacier County increased from \$81,586,000 in 1987 to \$130,717,000 in 1997, an average annual growth rate of 4.8 percent. The largest industries in 1997 were: services, 27.0 percent of earnings; state and local government, 16.1 percent; and farm, 13.4 percent. In 1987, the largest industries were services, 23.5 percent of earnings; state and local government, 16.9 percent; and federal civilian government, 10.3 percent. Of the industries that accounted for at least 5 percent of earnings in 1997, the slowest growing from 1987 to 1997 was retail trade (9.1 percent of earnings in 1997), which increased at an average annual rate of 4.3 percent. The fastest was farm industry, which increased at an average annual rate of 9.0 percent.

Mining comprised 6 percent of the earned income in the economy. All of this is from the oil and gas industry. Hotels and other lodging was the largest component of the services sector (19 percent). This is more than four times the state percentage

for that industry. The farm industry is 13.4 percent of the earnings in Glacier County, which is also more than four times the state for farming (3 percent).

Table 3-15, Economic Structure Profile, shows income by sector for Glacier County.

Components of Total Personal Income

Total personal income (TPI) includes the earnings (wages and salaries, other labor income, and proprietor's income); dividends, interest, and rent; and transfer payments received by the residents of Glacier County. In 1997, earnings were 61.3 percent of TPI (compared with 58.6 percent in 1987); dividends, interest, and rent were 11.5 percent (compared with 18.5 percent in 1987); and transfer payments were 27.1 percent (compared with 22.9 percent in 1987). In 1997 for Montana, earnings were 60.2 percent of TPI; dividends, interest and rent were 19.5 percent and transfer payments were 20.3 percent. From 1987 to 1997, earnings increased on average 4.8 percent each year; dividends, interest, and rent decreased on average 0.5 percent; and transfer payments increased on average 6.1 percent.

Figure 3-1 shows real (adjusted for inflation) personal income per capita peaked in 1976 and has been relatively stable since the early 1980's. Glacier County income per capita is the lowest of the four counties in the study area.

LEWIS AND CLARK COUNTY

Helena is the county seat and the state capitol. It is the sixth largest city in Montana. Augusta and Lincoln are unincorporated towns near the study area. Many people entering the Bob Marshall Wilderness go through Augusta.

Earnings by Industry

Earnings of persons employed in Lewis and Clark County increased from \$479,489,000 in 1987 to \$871,484,000 in 1997, an average annual growth rate of 6.2 percent. The largest industries in 1997 were services, 30.1 percent of earnings; state and local government, 24.6 percent; and retail trade, 10.1 percent. In 1987, the largest industries were state and local government, 27.9 percent of earnings; services, 24.3 percent; and retail trade, 11.3 percent. Of the industries that accounted for at least 5 percent of earnings in 1997, the slowest

growing from 1987 to 1997 were transportation and public utilities (5.1 percent of earnings in 1997), which increased at an average annual rate of 0.8 percent. The fastest growing was construction (6.4 percent of earnings in 1997), which increased at an average annual rate of 11.6 percent.

Mining comprised only 0.3 percent of the earned income in the economy. Nearly 70 percent of the earned income from mining in Lewis and Clark County is from metal mining. Farm earnings in Lewis and Clark County are also just 0.3 percent of the county total earnings. The state total is 3 percent. Earnings from state and local government (24.6 percent) are nearly twice the state level (13.4 percent), primarily because Helena is the state capitol.

Table 3-15, Economic Structure Profile, shows income by sector for Lewis & Clark County.

Components of Total Personal Income

In 1997, earnings were 63.7 percent of TPI (compared with 64.2 percent in 1987); dividends, interest, and rent were 17.5 percent (compared with 18.4 percent in 1987); and transfer payments were 18.8 percent (compared with 17.4 percent in 1987). From 1987 to 1997, county earnings increased on average 5.9 percent each year; dividends, interest, and rent increased on average 5.4 percent; and transfer payments increased on average 6.8 percent.

Figure 3-1 shows real per capita income has grown steadily since 1969. In the study area, all the other counties have more volatile per capita income trends because of the much higher proportions of earnings from the farming sector.

PONDERA COUNTY

Conrad is the county seat for Pondera County. A small portion of the Blackfeet Indian Reservation is located in the north portion of the county. Dupuyer is an unincorporated small town near the project area. The primary industry in this town is ranching. Heart Butte is within the Blackfeet Indian Reservation.

Earnings by Industry

Earnings of persons employed in Pondera increased from \$48,968,000 in 1987 to \$81,654,000 in 1997, an average annual growth rate of 5.2

percent. The largest industries in 1997 were farm, 37.8 percent of earnings; services, 12.6 percent; and state and local government, 11.6 percent. In 1987, the largest industries were farm, 31.4 percent of earnings; state and local government, 13.8 percent; and services, 12.6 percent. Of the industries that accounted for at least 5 percent of earnings in 1997, the slowest growing from 1987 to 1997 was state and local government, which increased at an average annual rate of 3.4 percent; the fastest was construction (10.9 percent of earnings in 1997), which increased at an average annual rate of 13.1 percent.

Mining comprised only 3 percent of the earned income in the economy. All of this is from the oil and gas industry. Farm earnings were 37.8 percent of the earnings by industry in Pondera County, compared to 2.8 percent for the State of Montana. The services sector (12.6 percent) is less than half the state rate (27.3 percent).

Table 3-15, Economic Structure Profile, shows income by sector for Pondera County.

Components of Total Personal Income

In 1997, county earnings were 56.8 percent of TPI (compared with 55.5 percent in 1987); dividends, interest, and rent were 22.7 percent (compared with 28.4 percent in 1987); and transfer payments were 20.4 percent (compared with 16.1 percent in 1987). From 1987 to 1997, earnings increased on average 5.0 percent each year; dividends, interest, and rent increased on average 2.5 percent; and transfer payments increased on average 7.3 percent.

Figure 3-1 shows real per capita income has been quite volatile, due entirely to the high proportion from farm sector earnings.

TETON COUNTY

The county seat of Teton County is Choteau. Much of the industry in the county is farming or farming related. The only incorporated communities in Teton County are Choteau, Dutton and Fairfield.

Earnings By Industry

Earnings of persons employed in Teton increased from \$43,233,000 in 1987 to \$82,417,000 in 1997, an average annual growth rate of 6.7 percent. The

largest industries in 1997 were farm, 44.4 percent of earnings; transportation and public utilities, 11.4 percent; and state and local government, 10.0 percent. In 1987, the largest industries were farm, 31.7 percent of earnings; state and local government, 13.1 percent; and transportation and public utilities, 11.0 percent. Of the industries that accounted for at least 5 percent of earnings in 1997, the slowest growing from 1987 to 1997 was state and local government, which increased at an average annual rate of 3.8 percent; the fastest was farm, which increased at an average annual rate of 10.3 percent.

Mining comprised only 0.9 percent of the earned income in the economy. All of this is from the oil and gas industry. Farm earnings were 44.4 percent of the earnings by industry in Teton County, compared to 2.8 percent for the State of Montana. The service sector is 7.8 percent of the total earnings in Teton County while the state rate (27.3 percent) is 3.5 times larger.

Table 3-15, Economic Structure Profile, shows income by sector for Teton County.

Components of Total Personal Income

In 1997, Teton County earnings were 59.0 percent of TPI (compared with 51.6 percent in 1987); dividends, interest, and rent were 23.0 percent (compared with 30.6 percent in 1987); and transfer payments were 18.0 percent (compared with 17.8 percent in 1987). From 1987 to 1997, earnings increased on average 6.8 percent each year; dividends, interest, and rent increased on average 2.4 percent; and transfer payments increased on average 5.4 percent.

Figure 3-1 shows real per capita income for Teton County has been quite similar to Pondera County because of the very high level of farm sector earnings.

FOUR-COUNTY STUDY AREA

Table 3-15, Economic Structure Profile, summarizes and compares income derived from eleven employment sectors for the four counties and Montana.

TABLE 3-15: ECONOMIC STRUCTURE PROFILE (% By Earned Income – 1997)

Sector	Glacier County	Lewis & Clark County	Pondera County	Teton County	Montana State
Farming	13	<1	38	45	3
Agriculture Services	<1	<1	1	2	1
Mining	6	<1	3	1	3
Construction	3	6	11	3	8
Manufacturing	1	4	2	1	8
Transportation & Public Utilities	7	5	2	11	8
Wholesale Trade	2	3	4	7	5
Retail Trade	9	10	8	6	13
Finance, Insurance & Real Estate	3	8	4	3	5
Services	27	30	13	8	27
Government	28	32	14	13	19
Total	100	100	100	100	100

Figure 3-1, Real Personal Income Per Capita, illustrates the fluctuations and trends in per capita income.

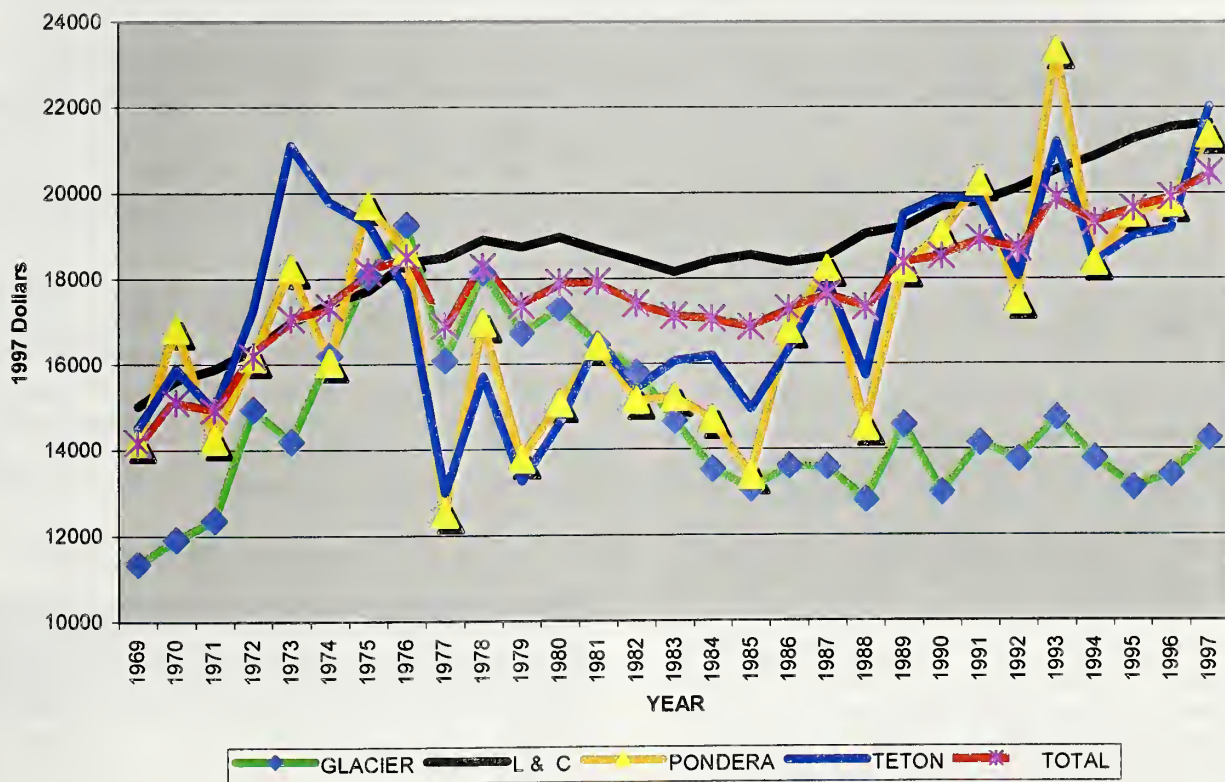
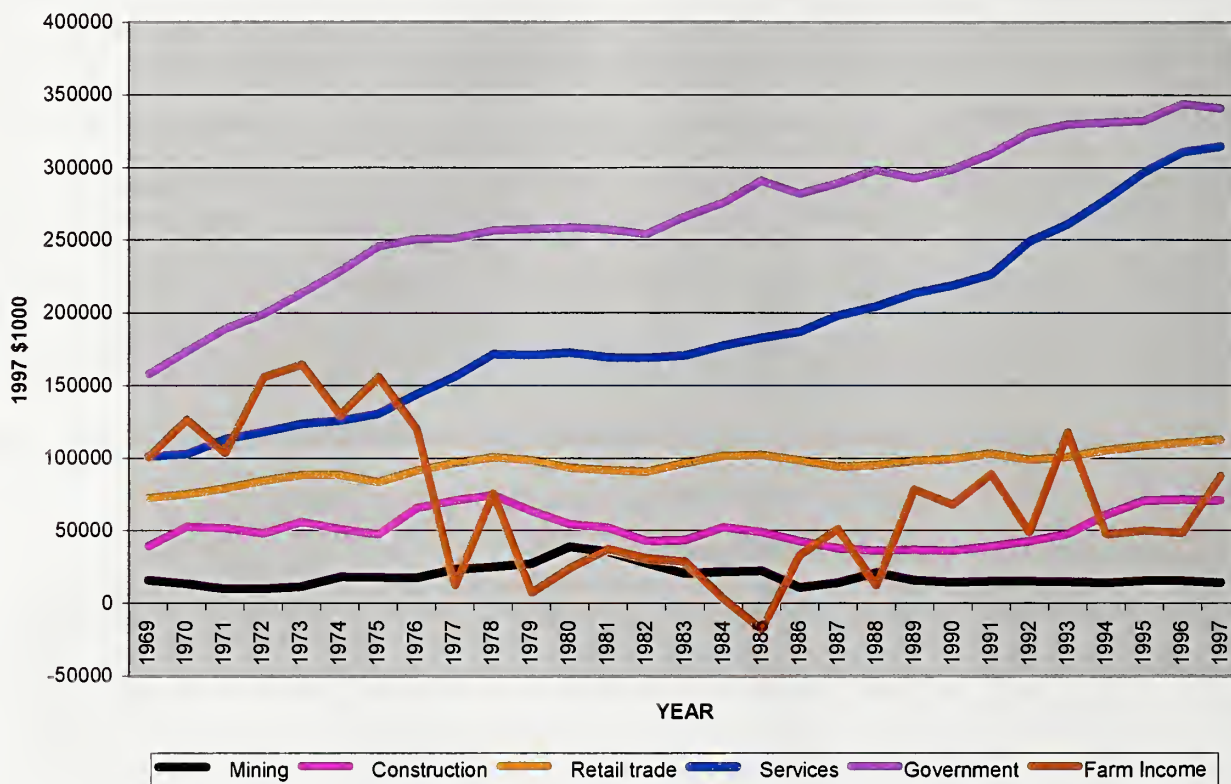
Figure 3-1: REAL PERSONAL INCOME PER CAPITA

Figure 3-2 shows the personal income by sector for the four county study area. Real income in the government sector has more than doubled since 1963. It is the single largest source of income, in large part because the state capitol, Helena, is

included in the study area. Income from retail trade has more than tripled during the same time. Farm income was lower in real terms in 1997 than in 1969. In addition, farm income has been very volatile from year to year.

Figure 3-2: PERSONAL INCOME BY SECTOR



Economic Diversity

An indication of economic health is the diversity of the economy. Two common measures are the number of economic sectors represented in the local economy and the Shannon-Weaver Index, which compares the actual employment in each sector with an economy with equal amounts of employment in each sector.

If economic diversity is defined as "the presence in an area of a great number of different types of industries" or "the extent to which the economic activity of a region is distributed among a number of categories", then it is useful to have a summary statistic to describe the diversity of an area and compare it to other areas.

The Shannon-Weaver entropy function (Shannon and Weaver 1949) has been used to calculate indices of economic diversity (Attaran 1986). The entropy method measures diversity of a region against a uniform distribution of employment where the norm is equi-proportional employment in all industries. Table 3-16 compares the diversity of the four study area counties.

TABLE 3-16: ECONOMIC DIVERSITY

County	Number of Economic Sectors	Shannon-Weaver Index, 4 digit level
Glacier	87	0.564
Lewis & Clark	159	0.627
Pondera	84	0.601
Teton	88	0.576

Based on the number of economic sectors, Lewis & Clark County is much more diversified than the other three counties. The maximum number of sectors is 528. The Shannon-Weaver Index also indicates that Lewis & Clark County is the most diversified of the four counties, but not by as much as was indicated purely on the number of economic sectors. A completely diversified economy would have a Shannon-Weaver Index of 1.0.

Employment and Income

The employment and income section describes employment and income trends and potential effects of mineral withdrawal for the study area. Employment and income information is summarized and compared in the Four County Study Area discussion.

GLACIER COUNTY

The Glacier County labor force has remained stable since 1980. The unemployment rate has been high. The rate has varied from 14.7 percent in 1995 to a low of 8.5 percent in 1980. Since 1980, only two years have been below 10 percent. Total employment has fluctuated since 1980, but has been increasing since 1990.

Service and retail trade jobs have shown the most increase since 1980. Other industries such as mining, manufacturing and wholesale trade have seen reductions. Mining has been relatively stable in the 1990's.

The 1997 per capita income in Glacier County was \$14,243. In 1997, the average wages of workers were \$19,554. The highest paying jobs were in the transportation and public utilities, government and mining industries. The lowest paying jobs were in the retail trade, manufacturing and services industries.

LEWIS & CLARK COUNTY

The Lewis and Clark County labor force has seen constant increases since 1980. The unemployment rate has varied from a low of 4.1 percent in 1994 to a high of 7.2 percent in 1982 and 1983. Total employment has increased steadily from 1980 to 1996.

Employment increased substantially in the services sector. This area nearly doubled in total

employment. Most other sectors also increased. The farm industry was the only area that lost employment.

In 1997, Lewis and Clark County had a per capita personal income (PCPI) of \$21,635. This PCPI ranked sixth in the state and was 110 percent of the state average, \$19,660 and 86 percent of the national average, \$25,288.

Average annual wages for workers in Lewis and Clark County in 1997 were \$23,862. The highest paying jobs were in the mining, transportation-public utilities and government industries. Mining jobs, though high paying, were very scarce. The lowest paying jobs were in retail trade, agriculture, services-forestry-fishing and services industries.

PONDERA COUNTY

The Pondera County labor force has climbed slightly since 1992. The recent unemployment rate has varied from a low of 3.4 percent in 1993 and 1994 to a high of 5.2 percent in 1998. Total employment has remained fairly constant on since 1980.

Total employment in Pondera County has been fairly static, but the distribution of jobs has changed. The finance-insurance-real estate, construction and agriculture services-forestry-fishing sectors have all experienced large gains. Transportation and public utilities, wholesale trade, mining and farm sectors all showed decreases.

In 1997, Pondera County had a per capita personal income (PCPI) of \$21,354. This PCPI ranked 10th in the state and was 109 percent of the state average, \$19,660 and 84 percent of the national average, \$25,288.

Average annual wages for workers in Pondera County in 1997 were \$18,719. The highest paying jobs were in the construction, mining and wholesale trade industries. The lowest paying jobs were in the retail trade, services and manufacturing industries.

TETON COUNTY

The Teton County labor force has climbed slightly since 1992. The recent unemployment rate has varied from a low of 2.4 percent in 1993 to a high of 3.9 percent in 1998. Total employment has climbed slightly since 1980.

Total employment in Teton County has fluctuated since 1980, but since 1992 appears to be increasing. Most industries have shown small gains in employment. Services and agriculture services-forestry-fishing have had the largest increases. Farm employment has been steadily dropping since 1980.

In 1997, Teton County had a per capita personal income (PCPI) of \$22,019. This PCPI ranked fifth in the state and was 112 percent of the state average, \$19,660 and 87 percent of the national average, \$25,288.

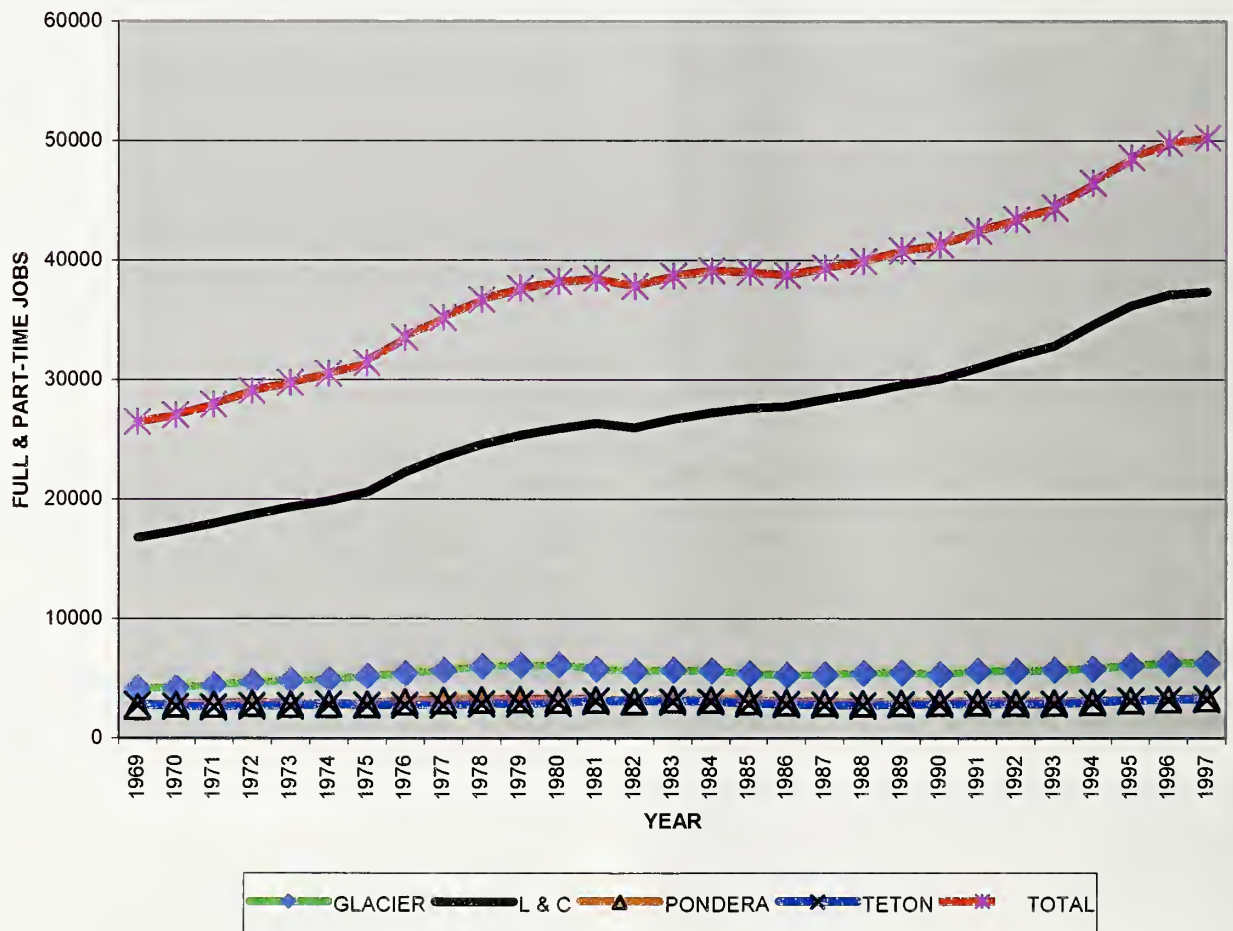
Average annual wages for workers in Teton County in 1997 were \$18,807. The highest paying jobs

were in the transportation-public utilities, wholesale trade and financial-insurance-real estate trades. The lowest paying jobs were in the retail trade, services and manufacturing industries.

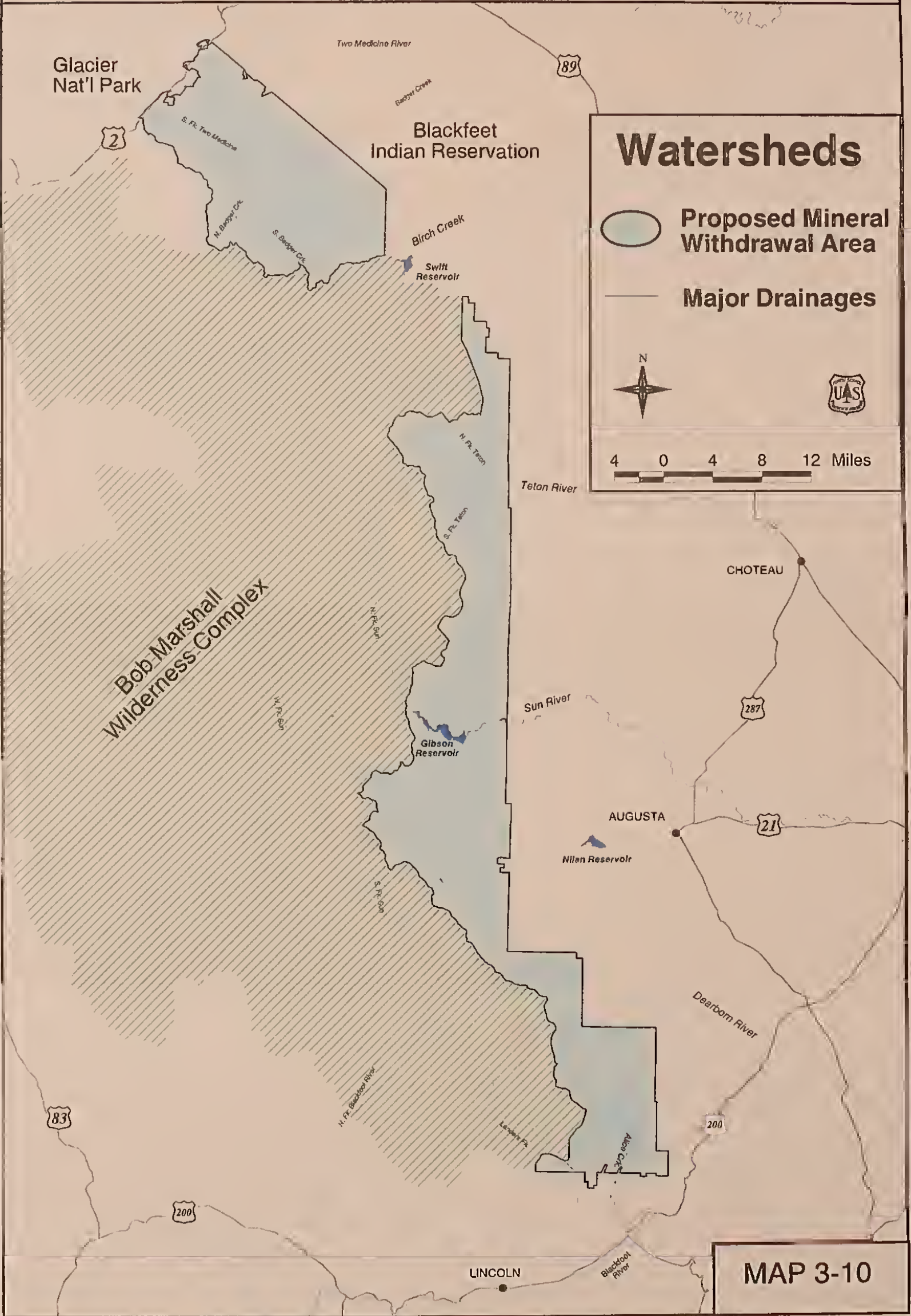
FOUR-COUNTY STUDY AREA

Figure 3-3 shows the trend in total employment for the study area. Only Lewis & Clark County has shown significant growth during the period with employment roughly doubling while the other three counties in the study area have remained relatively constant.

Figure 3-3: AREA EMPLOYMENT



Proposed Rocky Mountain Front
Mineral Withdrawal
Lewis and Clark and Helena National Forests



Environmental Effects

Effects of Alternative A

Under Alternative A, approximately 405,000 acres of federal land would remain available for mineral entry. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes that a geologic mapping and geochemical and geophysical surveying program would take place once every ten years. Exploration by drilling is expected 5 times in 100 years. The probability of detailed drilling and development is much less (0.1%). These activities will not be covered in the effects discussion because their probability of occurrence is so low.

Under this alternative, the only mining-related activity expected would be prospecting and exploratory operations, resulting in little change in economic diversity. It is expected that there would be limited surveying and drilling operations. Sampling and exploration usually involves a crew brought in to conduct operations over the summer. They may stay in local motels and buy some supplies locally. The length of operations would depend on the size of the area surveyed.

An exploratory drilling operation could have a crew of up to 10 workers. There would be additional work in constructing access, if needed. The length of operations would depend on the number and depth of drill holes.

Neither of these activities would substantially change the economic diversity of the four-county area.

Effects of Alternative B

Under Alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes no mines would be developed and no other exploration would take place.

There would be no increase in employment and income or any changes in the economic diversity of the four-county area because of locatable mining activities. There would be no mining activities taking place on National Forest Lands within the mineral withdrawal area.

WATER RESOURCES AND FISHERIES

Introduction

This section addresses the potential for the proposed mineral withdrawal to protect the water resources in the study area.

The major watersheds in the Rocky Mountain Front study area include the Dearborn, Sun, Teton, Marias and Blackfoot River systems. Streams east of the continental divide ultimately confluence with the Missouri River in Central Montana. Alice Creek, west of the divide, ultimately flows into the Clark Fork River in Western Montana. All watersheds in the study area are headwater drainages.

These river systems provide a variety of beneficial uses including recreation, domestic and agricultural water supply and aquatic habitat. Most perennial streams support fish populations.

The major drainages within the study area are shown on Map 3-10, Watersheds.

Management Direction

Forest Plan standards and guidelines direct water and fisheries management by incorporating agency direction, state and federal regulations and Cooperative Agreement with the State of Montana. Forest Service Manual direction and objectives, along with a list of major legislation affecting water resources is included in Appendix H.

Forest Service management objectives for water resources include:

- Reduce risk of flooding
- Minimize impacts of flood on human safety, health, and welfare
- Minimize destruction, loss and degradation of wetlands
- Preserve and restore the natural and beneficial values of floodplains and wetland

The Montana Water Quality Act, Nondegradation Rules and Surface Water Quality Standards further assure the protection of water resources. It requires

that "land management activities must not generate pollutants in excess of those that are naturally occurring, regardless of the stream's classification". "Naturally occurring" is defined in ARM 16.20.603 as: "the water quality condition resulting from runoff or percolation over which man has no control or from developed lands where all reasonable land, soil and water conservation practices have been applied".

Reasonable land, soil and water conservation practices are commonly called Best Management Practices (BMPs). BMPs are considered reasonable only if beneficial uses are protected. BMPs are the primary means of complying with State Water Quality Laws.

Affected Environment

Affected environment descriptions are general, not technical or highly site specific, because of the programmatic nature of the decision to be made. A general discussion of natural watershed conditions and causes of change is followed by table showing physical conditions of study area watersheds. After describing the physical conditions, the fisheries are addressed.

Natural Watershed Conditions and Causes of Change

The physical and chemical attributes of a stream provide the habitat framework for the development of the biological community. Physical attributes (e.g., stream gradient, substrate characteristics, channel dimensions) and chemical attributes (e.g., water quality) are products of the climate, geology, and soils, topography, vegetation, hydrology and land use of a watershed.

Most study area landforms include steep limestone reefs and associated sandstone/shale slopes. The limestone is relatively resistant to weathering, whereas the sandstone/shale geology weathers to fine grained material including silts and clays. The sandstone/shale produces both, a continual source (low to moderate yield) of upslope sediment and an intermittent source of mass wasting material with high to very high yields.

The relatively high elevations along the Front allow for high average annual precipitation of up to 60 inches. The combination of deep snowpacks, steep

slopes and warm chinook winds can produce rapid runoff conditions on an annual basis.

Past flood events typically occurred in late spring when heavy rains contributed significant surface flows to channels already full with snowmelt runoff. The flood of June 1964 produced the highest discharge levels ever recorded for most streams and rivers along the Rocky Mountain Division (Boner and Stermitz 1967). While the 1975 flood had lower peak flows than the 1964 flood, the flood levels were sustained longer, thereby exceeding the total monthly discharge of the 1964 flood.

These recent flood events played an important role in forming the existing channel conditions. Some of the headwater channels are deeply entrenched with scoured banks; wide, open floodplains with large cobble/gravel deposits are typical of the middle and lower portions of the main stem channels. The channels are still adjusting in these open floodplains; active meandering is common along the unstable alluvial banks.

In the upper stream reaches, natural stream sediment comes from dry creep (gravitational movement of surface soils), overland flow and mass failures. In-channel erosion of loose alluvium contributes sediment in the lower reaches. In general, sediment supply exceeds sediment transport capacity under average flow regimes.

Stream flow varies considerably throughout the Front Range. Watersheds that lie within the limestone reefs have intermittent flow by mid summer. Stream flow subsides and resurfaces in response to solution channels (cavities that have formed through water movement and dissolution of minerals) in the limestone and coarse alluvial deposits in the valley bottoms.

Recent fires have affected portions of the North Fork of the Sun River and headwater tributaries of the Dearborn River. These fires have most likely resulted in increased water and sediment yields in these drainages.

Beavers are common in Alice Creek, as well as other drainages. They continue to influence channel structure.

The most important human induced changes in water resources are grazing, roads and water uses. Most of the drainages have grazing allotments, but because of the steep terrain, grazing pressure is generally concentrated in the valleys, meadows and

flat plateaus. Headwater channels with flat gradients and banks composed of fine sediments are sensitive to grazing and generally have been affected to some degree from bank trampling. Mainstream channels have a lower sensitivity to grazing because they are armored with larger substrate and generally lack forage in floodplain areas.

Roads are limited to the major access routes; trails are found throughout the study area. Roads have resulted in elevated levels of sediment where stream channels are confined because of fill-slopes or ford locations. Trails have also resulted in elevated levels of sediment; confined to ford locations.

Two major reservoirs occur within or near the study area. Gibson Reservoir is located within the study area on the Sun River. Gibson has a storage capacity of 105,000 acre-feet. Swift Reservoir, just outside the study area, is located on Birch Creek and has a storage capacity of 30,000 acre-feet.

Water impoundments and water diversions can have significant effects on downstream channels. Since reservoirs interrupt the sediment transport process, immediate downstream channels may become sediment deficient as fine substrate is washed out of the coarser material. Flow regulations can be both beneficial and detrimental. Flood flows can be regulated so that peak discharges are reduced with lower impacts to channels. Conversely, regulated flows may not allow for the high flows needed to flush sediment downstream. In this case, sediment may tend to accumulate in the downstream channels.

The Summit Creek watershed is classified as an A-closed municipal watershed, although it no longer supplies the town of Summit with surface water for domestic use.

Watersheds

In 1998, the Forest Service conducted the Inland West Watershed Reconnaissance (IWWR). The overall purpose of the reconnaissance was to allow the Forest Service to focus limited federal dollars on the most important watersheds and provide for the orderly management of all watersheds over time. The ultimate goal of the IWWR was to consistently evaluate the status and distribution of fish on National Forest System lands in the Inland West.

Hydrologists mapped watersheds/drainages into sixth field hydrologic units (watersheds). Forty-eight

watersheds were delineated in the proposed withdrawal area. Hydrologists and fisheries biologists then rated the existing conditions of each watershed in terms of geomorphic integrity, watershed vulnerability, water quality integrity and status of fisheries. The reconnaissance and rating process consisted of identifying stream segments that were crucial or damaged, according to a set of definitions and criteria. These characteristics are explained below. A complete description of the methods and protocols used in the IWWR are available in the project file.

Geomorphic Integrity - reflects the existing soil-hydrologic function (ability of land to absorb and store water and act as a sponge-and-filter) and existing physical soil-stream resilience. Each watershed was rated high, moderate or low relative to its natural potential condition.

Water Quality Integrity - reflects overall water quality in a watershed. Water quality impacts include bank damage, sediment loads, channel modification, flow disruption, thermal change, chemical contamination and biological stress. Each watershed was rated high, moderate or low based on the number of miles of damaged stream segment and degradation of resource values.

Watershed Vulnerability - reflects inherent risks of conditions becoming degraded if certain sensitive lands in the watershed are disturbed. Each watershed was rated low, moderate and high relative to how much of the area is classified as sensitive lands. Sensitive lands are areas where disturbances pose a high probability of degrading watershed soil-hydrologic functions or stream segments. Sensitive lands include: areas with highly dissected slopes, highly erodible soils, and areas with landslide deposits or potential landslides.

Watershed conditions for the study area are summarized in Table 3-17, Watershed Conditions. The geomorphic integrity for the majority of watersheds is either moderate or high; meaning they are functioning well compared to their natural potential. For the majority of the watersheds, the overall water quality is high. The watershed vulnerability ratings, high (33%) and moderate (44%) for the most of the area, reflect that lands are considered sensitive. This means that disturbances are likely to affect soil-hydrologic function or stream segments in most of the area.

TABLE 3- 17: WATERSHED CONDITIONS

<i>Rating</i>	<i>Geomorphic Integrity</i>		<i>Water Quality Integrity</i>		<i>Watershed Vulnerability</i>	
	#	%	#	%	#	%
High	23	48	38	79	16	33
Mod.	21	44	9	19	21	44
Low	4	8	1	2	11	23

Water Quality Limited Stream Segments

Riparian and stream conditions are assessed by the Montana Department of Environmental Quality (MDEQ) to determine water quality limited stream (WQLS) segments. The 1998 Montana 303(d) List (MDEQ 1998) identifies three streams within the Lewis & Clark Forest boundary (study area) as being water quality limited; the North Fork of the Teton, the Sun River and Blackleaf Creek. There are no WQLS in the Helena portion of the study area.

"Water quality limited" streams do not fully support all beneficial uses and therefore, do not fully meet water quality standards. All streams segments identified below have a low priority for Total Maximum Daily Load (TMDL) development as determined by the MDEQ. TMDLs set limits on point and non-point source pollution loading to WQLS segments.

The North Fork Teton segment is located from the confluence with the South Fork upstream to its headwaters. Aquatic life support and cold-water fisheries (trout) are listed as partially supported. The probable cause is flow alteration and "other" habitat alterations. Highway/road/bridge construction is identified as a source of impairment, along with natural sources.

The Sun River segment is located from Gibson Dam downstream, to below the Forest boundary. Aquatic life support, cold water fisheries (trout), swimming and recreation are listed as partially supported. The probable causes include flow alteration, nutrients, siltation, suspended solids and thermal modifications. Probable sources of impairment

include agriculture, flow regulation/modification and irrigated crop production.

The Blackleaf Creek segment is located from its headwaters downstream to below the Forest Boundary. Aquatic life support, cold-water fisheries (trout) and drinking water supply are listed as partially supported. The probable causes include salinity/TDS/chlorides and siltation. Probable sources of impairment include agriculture, petroleum activities and resource extraction.

Other WQLS segments that are located immediately below the Forest boundary (adjacent to the study area) include the Dearborn River, Ford Creek and Willow Creek.

The 1998 303(d) list also identifies stream segments that are fully supporting their uses, but the uses are "threatened". The threatened status may be identified for streams that currently have no activities within the watershed, but may have activities proposed or anticipated in the future. Threatened segments that are located within or immediately below the Forest boundary include the North Fork, South Fork and main stem of Dupuyer Creek, South Fork Two Medicine, South Fork Badger, South Fork Birch and Elbow Creek.

Wetlands and Floodplains

Wetland functions include: ground water recharge and discharge, flood flow alteration, sediment stabilization, sediment and toxicant retention, nutrient removal and transformation, production export of organic material, wildlife diversity and abundance, and aquatic diversity and abundance. Wetlands are also valued for recreation.

Wetlands are found throughout the study area, especially where ground water saturates portions of the lower mountain slopes. Wetlands are associated with numerous seeps and springs, depressions accumulating snowmelt and streamside and lakeside areas.

Wetlands have not been mapped for the study area. Soil aggregate maps can be used to identify areas with high probability of wetlands. Aggregates in the study area with a high probability having wetlands are:

- Alluvial floodplains and terraces
- Mixed colluvial deposits
- Mixed landslide deposits
- Compact loamy glacial till and moraines

- Metasedimentary rocks, glacial mountain slope and cirque basins

Groundwater

Groundwater within the study area is typically located in unconsolidated aquifers, i.e., streambed alluvium in which the water lies within or flows through loose gravel and sand. Pollutants can easily affect these aquifers because they are usually close to the surface.

All geologic units in the study area can potentially contain groundwater, with a variation in yields and quantity depending on the formation. Those units with high degree of porosity and permeability (unconsolidated surface gravels, sandstones and limestones) have the potential to contain large amounts of water. Those with low porosities and permeability will contain little free water and have low transmissivity characteristics.

There is a large amount of glacial till overlain by recent accumulations of alluvial material throughout the valley bottoms. The permeability of these materials is generally a function of their clay content. Near-surface groundwater is generally present in the valley bottoms, but probably limited due to adjacent steep slopes.

Fisheries

A review of fisheries is important to this study, considering the recreational value of fisheries within and outside the study area. The size, structure, and relative condition of fish populations reflect habitat conditions, and provide inferences about lower trophic levels.

Fish are routinely used to monitor stream systems because:

- They are good indicators of long-term effects and broad habitat conditions;
- They are at the top of the aquatic food chain and tend to integrate effects of lower trophic levels;
- They are consumed by humans, making them important subjects in assessing contamination;
- They are relatively easy to collect and identify to species level, and the

environmental requirements of individual species are comparatively well known; and

- Aquatic life uses (water quality standards) are typically characterized in terms of fisheries (Plafkin et al. 1989)

Montana Fish, Wildlife and Parks (MFWP) and the U.S. Forest Service have surveyed fish populations and habitat in most study area streams. Some of the smallest streams have yet to be inventoried. For the 1998 IWWR, hydrologists and fisheries biologists rated existing habitat conditions and status of key fish species.

Habitat Conditions

Natural events such as wildfires and floods have played major roles in shaping stream habitats in the study area. Although fish populations can often rebound quickly after the short-term effects of fires, the carrying capacity of mountain streams is largely limited by channel characteristics that can change dramatically during major floods. Pool depth and frequency, substrate composition, riparian vegetation, bank stability and instream cover provided by woody debris are primary features of fish habitat that can be greatly affected by floods. Some features, like undercut banks and deep pools with hiding cover, may take decades to reform after major floods like those of 1964 and 1975. Likewise, fish populations may be slow to recover in these streams.

Fish habitat conditions in most area streams are largely unchanged by human activities, except for the impoundment of the Sun River to form Gibson Reservoir. Livestock grazing is permitted in many of the watersheds. The resulting effects on fish habitat range from minor stream bank trampling to loss of bank vegetation and localized slumping. Decreases in overhanging vegetation and undercut banks, for example, result in a loss of hiding cover and pool habitat for fish. In some streams, sediment loads are increased by erosion from trails and old roadways.

Major floods in 1964 and 1975 caused massive bed load movements, channel widening and channel braiding in many streams. Fish habitat is slowly recovering to more optimal conditions in those areas. Large fires in the Falls Creek, upper Dearborn River and North Fork Sun River drainages in 1988 increased runoff and sediment loads, but the effects on fish habitat have been less drastic than the flood events.

Species and Populations

Although study area streams and lakes support a limited diversity of fish, most of the remaining native westslope cutthroat trout populations east of the Continental Divide are found here. Many of the remaining westslope cutthroat trout populations are small and isolated, and are vulnerable to catastrophic events such as floods, drought and extremely harsh winters. Furthermore, these native trout are being displaced or hybridized by introduced (non-native) trout species. As a result, the Forest Service has designated westslope cutthroat trout a *sensitive* species and the State of Montana has designated them a species of special concern. These designations mean that both agencies will consider the needs of this fish through habitat protection, fishing regulations and stocking policy.

Natural barriers, primarily waterfalls, prevented historical fish colonization of many miles of streams in the study area, including portions of the Badger, Birch, Teton and Willow basins, the entire Sun River drainage above the diversion dam and most of the Falls Creek drainage. The current distribution of non-native rainbow, brook and Yellowstone cutthroat trout is the result of extensive indiscriminate stocking by state and federal agencies and private citizens. These trout species are common throughout the area. Despite heavy stocking in the past, several streams have headwater reaches that remain fishless, due to waterfall barriers.

Westslope cutthroat trout are native to parts of Alice Creek and the Two Medicine, Teton, Sun and Dearborn River systems. According to the IWWR, populations persist in 27 streams within the study area. In three drainages, populations are stable or increasing. In the other 24 drainages, populations are depressed. Hybridization between westslope cutthroat trout and introduced trout species is widespread in the study area. About 20 stream reaches have yet to be adequately sampled to determine the presence of non-hybridized westslope cutthroat trout.

Very few native cutthroat trout populations are secure from the on-going encroachment of rainbow and brook trout. The westslope cutthroat trout fishery of the upper Badger Creek watershed is the largest, most viable remaining population in the project area, but it too is partially vulnerable to non-native fish encroachment. Westslope cutthroat

populations are also clustered in the headwaters of the upper South Fork Two Medicine River. Additional isolated populations are scattered south along the Front, including a few in streams on private lands outside of the study area.

A 1992 fisheries survey found genetically pure westslope cutthroat trout in Alice Creek, along with a population of brook trout. Westslope cutthroat trout and no brook trout were found in all Alice Creek tributaries that carry a perennial flow, including Bartlett Creek. Bear Creek was the only tributary which supported a small population of brook trout along with a much larger population of westslope cutthroat.

Alice Creek is considered a "Special Emphasis" watershed, one of several in the Blackfoot River drainage. The "Special Emphasis" is to maintain a refugia network for the protection and recovery of bull trout (listed as a *threatened species*). Bull trout are present in the lower reaches of Alice Creek. Surveys have not detected bull trout within the study area, but they may be present in low numbers. A 1993 survey found one large spawning bed and a 1999 survey found two smaller spawning beds in the lower reaches. It is likely that fluvial spawners migrating out of the Blackfoot River created these beds.

To some extent, all major streams draining the study area receive fishing pressure. Trout of any species are the primary game fish sought, but some anglers also value mountain whitefish. As expected, streams with adjacent roads or trails receive the greatest use. The Blackfoot, Dearborn, Sun, Teton and South Fork Two Medicine rivers are all popular fisheries. Badger Creek and its tributaries are also popular. Although most fish are less than ten inches long, trout over 14 inches can be found in more remote streams with good habitat. Fishing regulations implemented in 1996 require the release of all cutthroat trout caught in streams on the east side of the continental divide, except the Sun River. Regulations also require releasing cutthroat trout in Alice Creek.

Other fish native to the area include arctic grayling, mountain whitefish, mottled sculpin, mountain sucker, white sucker, longnose sucker, longnose dace, northern redbelly dace, and a few minnow species. By the mid 1900s, grayling have been extirpated from all waters except the Sun River below Diversion Dam, where a small population persists today, mostly in the Sunnyslope Canal. However, fluvial arctic grayling were introduced into

the upper North and South Forks of the Sun in 1999 and 2000 with the goal of establishing new populations. Mountain whitefish, two of the sucker species and minnows are most common in larger streams like the Dearborn River.

Water Associates

Water Associates are species that use streams or ponds for some part of their live cycle. Species of interest include: bald eagle, harlequin duck, northern bog lemming, boreal toad, northern leopard frog, common loon and beaver. Their status within the study area is described in the wildlife section's affected environment along probable effects of the alternatives.

Environmental Effects

A risk analysis was used to identify potential effects to water resources and fisheries. This analysis, in Appendix E, is the basis for the effects discussed below.

Effects of Alternative A

Under Alternative A, approximately 405,000 acres of federal land would remain available for mineral entry. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes that a geologic mapping and geochemical and geophysical surveying program would take place once every ten years. Exploration by drilling is expected 5 times in 100 years. The probability of detailed drilling and development is much less (0.1%). These activities will not be covered in the effects discussion because their probability of occurrence is so low.

If the No Action alternative were implemented, the consequences to water resources and fisheries would range from negligible to low. These effects are based on activities expected under the mineral activities forecast. The most likely changes affecting water resources and aquatic habitats are related to soil disturbance and sediment delivery to stream systems.

Prospecting and claim staking is expected once every ten years within the study area. The consequences of these activities would be negligible.

Prospecting and claim staking would not affect stream flows. Collection of soil samples and testing using hand-held instruments would not modify the vegetation in the study area. Changes in sedimentation, water quality or aquatic habitat within a watershed would be negligible. Sampling and claim staking would not affect wetlands, streams, rivers or lakes.

Exploration drilling or trenching is expected to take place approximately five times in one hundred years. These activities would have a greater impact on water resources and fisheries than prospecting and claim staking. The consequences would range from negligible to low depending on the location and scale of the drilling or trenching activities.

Drilling rigs generally use roads to access drill sites. Where roads are not present, they would need to be constructed. Helicopters have been used to move drilling equipment, but they are not generally cost-effective. Removal of vegetation for road and drilling sites would be minimal. Only the vegetation in the roadbed and along the shoulders would be disturbed. Drilling activities generally take place within the road and do not require additional pad construction. Trenching is usually accomplished with a bulldozer or backhoe. In some cases, mechanical or hydraulic rippers are used on tough ground. All of these activities have potential to increase sediment delivery to stream systems. Roads construction and trenching activities for exploration are within the jurisdiction of the Forest Service. BMPs would be required to minimizing amount and duration of increased sedimentation.

Extensive trenching operations or road networks are not predicted. However, if they do occur, minor increases in sediment from road construction, drilling and trenching are likely. Increased sediment could affect both water quality and aquatic habitat. The effect on fish habitat would range from negligible to low depending on the amount and timing of sediment delivery, and on the effectiveness of disturbed site revegetation.

The amounts of nutrients, organics or other chemicals determine water quality. It is unlikely that exploration activities would change water chemistry or result in contamination of ground water. The consequences of exploration on water quality would be negligible.

Impacts to stream flows are possible with certain surface disturbing activities that encompass a large area. Stream flows can increase with significant

vegetation removal and/or increase in road density. Short-term decreases are possible with drilling operations that require large amounts of water. Since extensive drilling, trenching and roading are not predicted, changes in stream flow would be negligible to low.

Prospecting and claim staking or further exploration is unlikely to affect fish populations. Although there might be a slight increase in people in a given drainage, it is unlikely that this would significantly increase fishing pressure beyond the vicinity of the claim site. If the personnel involved with mining activities fished, they would have to follow the same rules and regulations as other anglers.

Locating exploration drilling and trenching activities away from water would reduce potential effects. There are numerous regulations, such as the Montana Water Quality Act's nondegradation rules, that limit impacts on water resources. These requirements would minimize the effects of any mining-related activities on water resources and fisheries.

Effects of Alternative B

Under Alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes no mines would be developed and no other exploration would take place.

If this alternative were implemented, there would be no effects to water resources or fisheries from mining-related activities. Other activities ongoing or planned in the near future would continue and the effects of these activities would not change.

RESEARCH NATURAL AREAS

The study area includes two Research Natural Areas (RNAs). RNAs are managed to maintain the natural conditions and natural processes that characterize these areas.

Management Direction

Management direction for RNA's is found in Forest Service Manual 4063. RNA's are a part of a national network of ecological areas designated in perpetuity for research and education and/or to maintain biological diversity on National Forest System lands. RNA's are for non-manipulative research, observation and study.

RNAs are identified for designation through Regional and Forest level planning based on their representative and/or unique natural and ecological features. Once RNAs are established, both Forest Plans call for withdrawing them from mineral entry (LCNFP 3-61 and HNFP III-9).

Affected Environment

Indian Meadows RNA, located on the Lincoln Ranger District, Helena National Forest, was established in 1997. It occupies a 949 acre mid-elevation glaciated bench, the headwaters of Indian Meadows Creek. The northwest corner of the RNA (106 acres) is located within the Scapegoat Wilderness; the remainder (843 acres) is within the study area. This RNA features a variety of wetlands and meadows embedded in a matrix of lodgepole pine forest. Indian Meadows includes a rich representation of fens, meadows and ponds unaffected by human-related impacts. In addition to the predominate lodgepole pine forest type, lesser amounts of Douglas-fir, spruce and quaking aspen occupy the RNA. Three sensitive plants species are also present within the RNA. Indian Meadows is frequented by moose, elk, deer and black bear and provides habitat for grizzly bear.

Wagner Basin RNA, located on the Rocky Mountain Ranger District, Lewis & Clark National Forest, was established in 1994. It occupies 965 acres in the study area and contains a unique wetland complex. In addition, Wagner Basin provides examples of several riparian and aquatic habitat types listed as targets for the RNA system. Aspen and wetland communities, beaver ponds, cold springs, wet meadows and scree slopes are present. Upland rough fescue and Idaho fescue grasslands and limber pine and Douglas-fir forests are also represented in this RNA. Two sensitive plants species are present within the RNA. The basin is important winter range for bighorn sheep and the wetland provides habitat for grizzly bear.

Management area N-1 is the Helena designation for RNA's and M is the Lewis and Clark Forest's designation.

Environmental Effects

Effects of Alternative A

Under Alternative A, approximately 405,000 acres of federal land would remain available for mineral entry. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes that a geologic mapping and geochemical and geophysical surveying program would take place once every ten years. Exploration by drilling is expected 5 times in 100 years. The probability of detailed drilling and development is much less (0.1%). These activities will not be covered in the effects discussion because their probability of occurrence is so low.

If alternative A were implemented, the consequences to these Research Natural Areas would be negligible because Forest Plan direction states they should be withdrawn from all forms of mineral entry under the 1872 Mining Law after they are designated. They would be open for claim staking until the withdrawal process was initiated.

Effects of Alternative B

Under Alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes no mines would be developed and no other exploration would take place.

If this alternative were implemented, there would be no effects to RNAs from mining-related activities. They would be withdrawn from mineral entry, as specified in the Helena and Lewis & Clark Forest Plans.

Consistency of Alternatives with Forest Plan Direction

Alternative A is consistent with Forest Plan Direction. Although the RNAs would not be withdrawn at this time, they would still be planned for withdrawal in the future. Alternative B meets Forest Plan intent.

Although management direction calls for withdrawing RNAs from mineral entry, neither of these areas have been formally withdrawn.

AIR QUALITY

Management Direction

Air quality is mainly regulated by the Federal Clean Air Act (42 USC 7401-7626), The Clean Air Act of Montana and the State of Montana Air Quality Rules (ARM 16.08.101-1906).

Affected Environment

The study area is designated a Class II airshed under the Clean Air Act. The adjacent Bob Marshall Wilderness Complex is Class I. Protection of air quality is provided to Class I airsheds by severely limiting the amount of additional human caused air pollution that can be added. In Class II airsheds, a greater amount of human-caused pollution may be added. In no case, however, may pollutant concentrations exceed the national or state ambient air quality standards.

Specific data on air quality within the study area is lacking, overall the air quality is excellent. Wind dispersion is excellent most of the year. Winter inversions occasionally cause problems in Lincoln where air quality deteriorates primarily from local wood smoke. Sources of air pollution within the study area include road dust, engine exhaust, slash burning and wildfires. East of the Continental Divide, prevailing west and southwest winds will usually carry emissions away from Class I areas. West of the divide, prevailing winds are also from the west, carrying emissions away from Class I areas. Air pollution coming to the study area includes slash burning and wildfires in Western Montana, Idaho, Washington and Canada along with air-borne pollutants from industry and engine exhaust.

The Air Resources Reports for the Lewis & Clark and Helena are on file at respective National Forest Supervisor's Offices. Information on existing air quality conditions, for both these reports, was obtained from data collected by several Remote Automated Weather Stations on the Forest. Additional information was provided by air monitoring stations in Glacier National Park and the Bob Marshall Wilderness.

Environmental Effects

Effects of Alternative A

Under Alternative A, approximately 405,000 acres of federal land would remain available for mineral entry. The forecast for mineral activity, which was developed as one possible scenario for analysis purposes, assumes that a geologic mapping and geochemical and geophysical surveying program would take place once every ten years. Exploration by drilling is expected 5 times in 100 years. The probability of detailed drilling and development is much less (0.1%). These activities will not be covered in the effects discussion because their probability of occurrence is so low.

If the No Action alternative were implemented, the consequences to air quality would be negligible. These effects are based on activities expected under the Forecast for Future Mineral Activities (Appendix C).

Potential mining-related affects to air quality would be emissions from engine exhaust and dust from roads and trenching operations.

Prospecting and claim staking, expected once every ten years within the study area, would probably result in an undetectable increase in traffic. The consequences of these activities would be negligible.

Exploration drilling or trenching is expected to take place approximately five times in one hundred years. These activities could have a slightly greater impact on air quality than prospecting and claim staking. There might be a small increase in dust and vehicle and equipment emissions. The duration of these activities would be relatively short. The consequences would be negligible given the excellent existing air quality, along with excellent wind dispersion.

Effects of Alternative B

Under Alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for mineral activity, which was developed as one possible scenario for analysis

purposes, assumes no mines would be developed and no other exploration would take place.

If this alternative were implemented, there would be no effects to air quality from mining-related activities. Other activities ongoing or planned in the near future would continue, and the effects of these activities would not change.

Cumulative Effects

Cumulative effects from ongoing activities within the project area do not approach compromising the Federal Clean Air Act or Clean Air Act of Montana standards. There are no foreseeable activities adjacent to the study area that would significantly alter existing conditions.

Consistency of Alternatives with Forest Plan Direction

Both alternatives are consistent with the Helena and Lewis & Clarks Forest Plan direction.

REQUIRED DISCLOSURES

Energy Requirements

There are minimal energy requirements related to determining which lands would be administratively withdrawn from mineral entry. Subsequent activities such as exploration and development could involve substantial expenditures of energy and would be considered at the permitting stage for mine development. Expenditures of energy would be expected to increase with higher levels of mining and/or recreation use. However, the energy required to implement the action alternative, in terms of petroleum products, is insignificant considering national and worldwide petroleum resources.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Short-term uses are those uses that generally occur annually. Long-term productivity refers to the ability of the land to produce a continuous supply of a resource. A mineral withdrawal would affect short-term uses related to mining. A mineral withdrawal

helps maintain the long-term productivity of the land due to limitations on future mining.

Irreversible and Irretrievable Commitment of Resources

An irreversible commitment of resources results from a decision to use or modify resources that are renewable only over a long period. Nonrenewable resources such as minerals are an irreversible commitment, if used. An irretrievable commitment of resources refers to resources, resource production or the use of renewable resources that are lost because of land allocation or scheduling decisions.

A decision on whether to withdraw federal lands in the Rocky Mountain Front from mineral entry will not result in any irreversible or irretrievable commitment of resources. Under the proposed action, up to 405,000 acres of federal land would be withdrawn from locatable hard rock mineral entry. This action has certain effects, which are described throughout this chapter, including an economic opportunity foregone, but these are not irreversible or irretrievable commitments because the mineral resource remains on site and the withdrawal could always be revoked.

Under Alternative A, federal lands would not be withdrawn and therefore they would remain open and available for mineral entry. Although the projected consequences of this alternative are based on a mineral forecast, this is not a decision to permit mineral exploration or development. Any commitment of resources would not occur until such time that a decision is to be made on a mining proposal.

Possible Conflicts with Plans and Policies of Other Jurisdictions

No conflicts with other jurisdictions are anticipated because of the mineral withdrawal.

Probable Adverse Environmental Effects That Cannot Be Avoided

Implementation of a mineral withdrawal would not result in adverse environmental effects that cannot be avoided.

Critical Elements of the Human Environment

Elements that are subject to requirements specified in statute, regulation or executive order that are addressed throughout Chapter 3 include air quality, cultural resources, floodplains, American Indian religious concerns, threatened or endangered species, hazardous wastes, water quality (drinking/ground water), wetlands/riparian zones, wild and scenic rivers and wilderness. Other elements that would not be affected because they do not exist in the study area include designated Areas of Critical Environmental Concern and prime or unique farmlands.

Environmentally Preferred Alternative

Alternative B, Mineral Withdrawal, is the environmentally preferred alternative. This alternative causes the least damage to the biological and physical environment and best protects, preserves and enhances historic, cultural and natural resources.

Environmental Justice

During the course of this analysis, neither alternative considered resulted in any identifiable effects or issues specific to any minority or low-income population or community. The agencies have considered all public input from persons or groups regardless of age, race, income status, or other social/economic characteristics.

Examination of community composition, as required under E.O. 12898, found no minority or low-income communities to be disproportionately affected under any of the alternatives. This was not raised as an issued during scoping.

CHAPTER 4

CONSULTATION AND COORDINATION

SUBSTANTIVE CHANGES BETWEEN THE DRAFT EIS AND THE FINAL EIS

A new subsection titled "Release of the Draft EIS" which summarizes the efforts to ensure that the public was aware of the availability of the Draft EIS was added.

A new subsection titled "Meetings on the Draft EIS" which summarizes when and where meetings on the Draft EIS were held was added.

Information was added to the subsection titled "EXTERNAL – ELECTED OFFICIALS, AMERICAN INDIAN TRIBES" to document continuing efforts to keep elected officials informed about the progress of the project.

Information was added to the subsection titled "INTERNAL – FOREST SERVICE AND OTHER FEDERAL AGENCIES".

A section titled "PUBLIC COMMENT ON THE DRAFT EIS" which discusses the content analysis procedures, lists commentors and gives a brief summary of public comments was added. Full-text letters from other agencies and elected officials and the Forest Service responses to comments were added.

A list of individuals, other agencies, tribes and elected officials that are on the mailing list to receive a copy of the Final EIS/Summary is included in the section titled "DISTRIBUTION OF THE EIS".

"APPENDIX J, PUBLIC COMMENT ON DRAFT EIS AND AGENCY RESPONSE" was added.

EXTERNAL - GENERAL PUBLIC

Project Initiation and Public Notices

The Department of the Interior published a "Notice of Proposed Withdrawal and Opportunity for Public Meeting; Montana" in the *Federal Register* (Appendix A) on February 2, 1999. In this Notice, the Secretary of the Interior proposed a 20-year withdrawal of federal locatable minerals on up to 429,000 acres in Lewis and Clark, Teton, Pondera and Glacier Counties, Montana. The Notice also announced a 90-day comment period on the two-year segregation.

Lands proposed for the withdrawal include all National Forest System lands in the Rocky Mountain Division of the Lewis & Clark National Forest. These lands are outside of the Wilderness, east of the Continental Divide. Also included are Helena National Forest lands on the Lincoln Ranger District, which are west of the Continental Divide, and east and outside of the Scapegoat Wilderness. The lands would remain open to all other activities consistent with applicable forest plans and activities related to valid existing rights. As part of this proposal, no new mining claims can be filed on federal lands during the two-year segregation period.

A Notice of Intent to prepare an Environmental Impact Statement was filed in the *Federal Register* June 4, 1999 (Appendix A). This notice announced a 30-day comment period and listed public meetings on the proposed 20-year withdrawal of National Forest System lands along the Rocky Mountain Front from locatable mineral entry.

An "interested citizen" letter was sent to more than 1000 individuals and organizations on June 4, 1999. The mailing list was compiled from names collected during the 90-day comment period on the two-year mineral segregation and from mailing lists compiled by forest staffs of the Helena and Lewis & Clark National Forests. The "interested party" letter described the proposal, supplied public scoping meeting locations and dates and requested comments or issues for consideration in the analysis process.

A news release was issued to area papers on June 4, 1999, describing the project and announcing dates of public meetings in Choteau and Lincoln, Montana. The news release asked the public to identify environmental issues, concerns, objections

or alternatives for consideration during the environmental analysis.

Another "interested citizen" letter was sent out on February 2, 2000, to approximately 900 people on the mailing list. The letter updated the public on where the Forest Service was in the preparation of the EIS, asked how they would like to receive the DEIS, gave a list of the issues that would be addressed in the EIS and responded to the comments that had been received during the initial scoping period.

Scoping Meetings

Two public scoping meetings were held for this project: Choteau, June 22, 1999, with attendance of 38 and Lincoln, June 24, 1999, with attendance of 14. At the public meetings, interdisciplinary team members were available to answer questions on the proposal, the timeline, the analysis process, and mining laws. Handouts available at the public meetings included a copy of the scoping letter with map, a brief synopsis of mining laws, a copy of "Questions and Answers Regarding the Proposed Rocky Mountain front Mineral Withdrawal and a copy of the *Federal Register* Notice of Intent.

Summary - Scoping Comments

The 90-day comment period on the 2-year segregation ended on May 4, 1999. Nearly 700 comments were received.

The 30-day scoping period ended on July 6, 1999. Approximately 300 comments were received by the end of the comment period. The majority of the comments (215) came from Montana residents, with a small number of comments (1-15) coming from residents of 30 other states. Of the comments submitted, 264 came from individuals, 26 came from organizational representatives and the remainder came from other federal agencies, state agencies and businesses. Many of the issues and concerns expressed by the public were focused on the effects of mining instead of the effects of a mineral withdrawal.

Release of the Draft EIS

On June 2, 2000, the Environmental Protection Agency published a Notice of Availability of the Draft EIS in the *Federal Register* (Volume 65, Number 107, page 35337). The notice specified

the comment period and contact person. Also, the notice announced public meetings in Lincoln and Choteau, Montana.

A press release was issued May 19 announcing the release of the Draft EIS and Summary and described the dates and locations of public meetings. The release was sent to local and regional media.

The complete draft of the Environmental Impact Statement or a summary was mailed May 19, 2000, to a mailing list of approximately 890 individuals, organizations, tribes, agencies and the media. Also, copies were provided to area public libraries. The complete text of the Draft EIS was posted on the forest web site for public viewing (www.fs.fed.us/r1/lewisclark).

The comment period on the Draft EIS closed July 17, 2000.

Meetings on the Draft EIS

Two public meetings were held to allow the public to express concerns and ask questions concerning the Draft EIS. Each meeting was conducted in an "open house" format with analysis team members available to respond to comments and questions concerning the proposal, analysis process and comment period. Handouts available at the public meetings included the complete DEIS, summaries of the DEIS and question and answer sheets.

Twelve people attended the June 7 meeting in Lincoln, Montana, and 21 people attended the Choteau meeting on June 8, 2000.

EXTERNAL - ELECTED OFFICIALS, AMERICAN INDIAN TRIBES

During the first week of June, 1999, briefing materials were provided to the Governor and offices of State government, congressional aides based in Great Falls and Helena, affected county commissioners and interested tribes. Personal briefings were conducted with Glacier, Lewis and Clark and Teton County Commissioners. The purpose of these briefings was to notify elected representatives that the Forest Service was

initiating the proposed mineral withdrawal process, inform them of projected time lines and solicit their participation.

Additional briefings for congressional aides, affected county commissioners and interested tribes were done as part of the Lewis and Clark National Forest issues briefings on a quarterly basis throughout the analysis process.

In February 2000, Forest Supervisor Rick Prausa, ID Team Leader Dave Whittekiend and Public Affairs Specialist Bonnie Dearing traveled to Washington, D.C., to brief the Montana Congressional staffs on the status of the analysis process. Briefing packets, which included a briefing paper, maps, and question and answer sheets, were provided.

The EIS Team Leader again briefed the Governor and staff of State agencies, and congressional aides in March 2000. In April, personal briefings were scheduled and completed with commissioners from Lewis and Clark, Pondera, Teton and Glacier counties. Also, personal phone calls were made to interested tribal governments.

INTERNAL - FOREST SERVICE AND OTHER FEDERAL AGENCIES

The lead agency for the EIS is the U.S. Department of Agriculture, Forest Service. The interdisciplinary (ID) team is comprised of members from the Lewis and Clark, Helena, Beaverhead/Deerlodge and Flathead National Forests, with support from the Northern Regional Office of the Forest Service.

"Scoping" of other federal agencies was conducted in July 1999. On July 16, 1999, Forest Supervisor Rick Prausa and team leader Dave Whittekiend briefed the Montana State Director, Bureau of Land Management and his staff. Telephone contacts were made with the Environmental Protection Agency (Helena) and the U.S. Fish and Wildlife Service. On July 26-27, 1999, a field tour of the project area was conducted for staff of the Forest Service Northern Regional Office and Washington, D.C., headquarters. During all these contacts, agency representatives were asked for concerns to be addressed in the analysis.

Prior to the release of the DEIS, Forest Supervisor Rick Prausa, ID Team Leader Dave Whittekiend and Public Affairs Specialist Bonnie Dearing traveled to Washington, D.C., to brief the Chief and staff on the status of the analysis process. The briefing included information packets and a power point presentation.

The Office of General Council, Bureau of Land Management and the Montana office of the Environmental Protection Agency were included in a federal interagency review of a preliminary Draft EIS before the document was finalized for public release. Comments from these agencies were considered, and suggestions for improving the document were used as appropriate, in the DEIS.

On June 15, 2000, a briefing on the proposed withdrawal and analysis process was conducted for the new Montana BLM State Director.

Copies of letters from federal agencies and responses to the letters are published in this Chapter following the "Summary of Public Comments."

DISTRIBUTION AND REVIEW OF THE DRAFT EIS

Distribution

Copies of the Draft EIS (or the DEIS Summary) were mailed to approximately 890 persons, groups, local governments, and agencies that expressed an interest in the project. The mailing list was compiled using the names and addresses from the following sources:

- Parties who requested to have their names placed on the mailing list for the project;
- Parties who participated at meetings and/or who submitted written comments to date in the process;
- Federal and State agencies consulted during the preparation of the EIS; and
- Other Federal, State, tribal and local (to the study area) entities potentially affected by the proposed withdrawal.

Review

Copies of the DEIS were provided for public review at the following locations:

- Northern Region Office, U.S. Forest Service, Missoula, Montana
- Lewis & Clark National Forest Supervisor's Office, Great Falls, Montana
- Helena National Forest Supervisor's Office, Helena, Montana
- Rocky Mountain Ranger District Office, Choteau, Montana
- Lincoln Ranger District Office, Lincoln, Montana
- Augusta Information Station, Augusta, Montana

Copies were placed in local public libraries in Great Falls, Helena, Lincoln, Choteau, Augusta, Cut Bank, Dutton, Browning, Conrad, Fairfield, and Valier, and at the Mansfield Library, University of Montana in Missoula, Montana Tech Library in Butte, Renee Library, Montana State University in Bozeman, and Montana State Library in Helena.

Copies of the document were available on the web at www.fs.fed.us/r1/lewisclark.

Copies of the document also were available from the following address:

Rocky Mountain Front Mineral Withdrawal Team
1101 15th Street North
Great Falls, MT 59403

PUBLIC COMMENT ON THE DRAFT EIS

Summary

The official public comment period for the Draft EIS closed on July 20, 2000. The team received approximately 55 written or e-mail comments that met the deadline. Additionally, more than 1000 "voting form" postcards were received as a result of an organizational campaign. Of the comments submitted, approximately 415 came from individuals, 31 came from organizational representatives and the remainder came from other federal and state agencies. Of the individual comments, many were e-mail form letters.

Full text agency letters are printed in this Chapter immediately following the Summary of Public Comments."

Letters that arrived following the comment deadline were not included in the content analysis, but are included in the project file.

Content Analysis Procedures

When received, each comment was recorded and given a unique "tracking number." Copies of all letters were sent to interdisciplinary team members for their consideration in the preparation of the Final Environmental Impact Statement. Two Forest Service employees read and coded each letter; then, reviewed each other's work. Comments were coded into categories that included: minerals, wildlife, cultural / heritage resources, roadless / Wilderness, visuals (scenery), economic, social, recreation, water, fisheries, process / planning, other alternatives, air quality, vegetation, soils and issues outside the scope of the proposal.

Table 4 – 1 lists the commentors and their assigned "tracking number." The text of extracted comments appears in Appendix J.

Table 4-1: List of Commentors

LETTER #	NAME
1	Bob Clark
2	Phyllis Wilcox
3	Lou Anna Denison
4	Gordon and Janet Whirry
5	Steve Hicks
6	Ted Cooney
7	Margaret Sentz
8	Peter Zadis
9	Jeff and Becky Blend
10	Bill Anderson
11	Laurie Ashley
12	Lynne Dickman
13	Kirk Thompson
14	Leana Schelvan
15	Yellowstone to Yukon Coservation Initiative Katherine Deuel
16	Janet Cremin
17	David A Lien
18	Walt Copeland
19	Robert Handelsman
20	Susan Ewing
21	Gary Matson
22	Paul Edwards
23	Pat McLeod
24	Brian Lents
25	Robert Carroll
26	Russell Blalack
27	Arlo Skari
28	Jim Stoltz
29	Will Boland
30	Michael Cooley
31	Edward Dobson
32	William Hendrix
33	Mike Hodges
34	William Madden
35	Kyle Joly
36	Em and Henry Allen
37	Joshua Burnim
38	Douglas Harvey
39	Steve Thompson
40	Jill Allison
41	Martha Alderson

LETTER #	NAME
42	Lisa Kleven
43	Dorothy Taylor
44	Nils Osterberg
45	Donald Thompson
46	Orion The Hunters Institute Jim Posewitz
47	Sean McAllister
48	John Noyes
49	Ray Goff
50	David Morris
51	Linda Stoll
52	Montana Council Trout Unlimited Bruce Farling
53	David Steinmuller
54	Coalition for Canyon Preservation, Inc. Sharlon Willows
55	Robert D. Stone
56	Natural Resources Defense Council Bernard M Lipman
57	Johanna Wald and Sara Rollet
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72	Genna Porter
73	Russ and Dee Barber
74	Donald Marble
75	Colin D. and Sharon MacLean
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77	Mary McRae
78	Rick Valois

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79	Larry M Krahj
80	Mert Freyholtz
81	Vicki Freyholtz
82	Sublette Riders Association Jonathan Ratner
83	Mrs John Buster Yellow Kidney
84	Linda Holding Schure
85	Bill McRae
86	Michael Yeager
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88	Stoney Burk
89	Dwight Willard
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110	Richard Spotts
111	Robert Nisbet
112	Sarah Helen Sentz
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115	Brian Derdowski
116	S Sepulveda
117	Swan View Coalition Keith Hammer
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119	Mary Sexton
120	Mark Quire
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123	Tim Flyn
124	Tom Kilmer
125	Marion County Water Watch Barbara Warner
126	Brian and Joy Healy
127	N.A.T.I.V.E.S. Renee Still Day
128	Mary Hamilton
129	Charles "Larry" Harris
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251	Thomas R Joste
252	Madeline Yamate
253	Ambience International - Institute of the Rockies - Lance Olsen
254	Wallace M. Elton
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262	Patrick E. McSweeney
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271	Bill Jaynes
272	Pat and Dick Tourangeau
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274	Alison A. Pearse
275	Philip M. Croll

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276	Steven Paull
277	Lee Bartlett
278	Continental Divide Trail Society Jim Wolf
279	Celia Bertoia
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315	Michael Garvin
316	David A. Hadden
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359	Jacqueline Heffern

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360	Marge Timko
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385	Gary E. Bortner
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393	Lynda and Michael Sexson
394	Frederick Del Grosso
395	Chris Marchion
396	Nina Heinzinger
397	Betsy Forbes
398	Mike Cooney
399	Paul Gazzo
400	Valerie Harms
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406	Philip Aaberg
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409	Bob Muth
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418	Katheryn L. Posten
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436	Alvin F. Sellers
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439	Steve Doyle
440	American Wildlands Deb Kmon
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444	Marshia Williams
445	Sara Toubman

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447	Sidney Shaw
448	Meg Haur
449	Thomas Harnden
450	Yvette Ortega
451	Last Chance Back County Horsemen - Bill Maloit
452	Irving L. Weissman
453	Jonathan Oppenheimer
454	Charlotte Kress
455	Martin Johansen
456	Jeff Blend
457	Pete Strazdas
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465	Montana Wilderness Association Dennis Tighe
466	Susan D. Auguston
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468	Scott Kappes
469	McLaughlin Insurance Services William C. McLaughlin
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471	Linda K. Christensen
472	June M. Thayer
473	E.P. Taylor
474	Justin Marble
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476	C.R. Cunningham
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478	Paul Harms
479	Herbert W. Samenfeld
480	Pat Hanson
481	Don Merritt
482	Curt Livingston
483	Maryanne Appel
484	Jesse Beaumont
485	Kathleen Kennedy
486	Dan Bennett

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487	John C. Rasch
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489	John Vollertsen
490	Neil Stressman
491	Daniel Shosky
492	Nancy Keenan
493	Lucie J. Vogel
494	Mary O'Brien
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501	Rebecca A. Hargis
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503	Dough Chestnut
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507	Curt Meyer
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526	Sylvain Pilon
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528	Murry Schoenberger
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532	Debe Pace
533	Steve Wallace
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535	Nicolette Butler
536	Rich Fisher
537	Joe DeFelice
538	Albert Borgmann
539	Christine C. McRae
540	Diana Wheeler
541	Mark W. Bohrer
542	John Mortenson
543	Gayle Layhee
544	Annick Smith
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546	John R. Boehmke
547	Dr. James D. Cleghorn
548	Carol Vuchetich
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SUMMARY OF PUBLIC COMMENTS

Many of those responding to the request for comments on the DEIS supported the withdrawal proposal by citing the need to preserve and protect the wildlife habitat, scenic vistas, cultural and historical values and watershed quality of the area. Some respondents wanted the area permanently withdrawn and others wanted the area added to the Wilderness system or Glacier National Park. Many commented about the degradation of the environment as a result of hard rock mining.

However, some respondents wrote that the withdrawal proposal was unnecessary as current regulations and laws are adequate to protect resource values in the event of mine development. Others commented that the possibility of finding minerals is so remote that the withdrawal is unneeded. Others feared withdrawal was a first step to locking out the public.

Specific comments with agency responses may be found in Appendix J.

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United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Denver Federal Center, Building 36, Room 1003
P.O. Box 26107 (D-108)
Denver, Colorado 80226-0007

June 29, 2000

ER 00/418

Mr. Rick Prausa
Forest Supervisor
Lewis and Clark National Forest
1101 15th Street North
P.O. Box 869
Great Falls, Montana 59403-0869

Dear Mr. Prausa:

The Department of the Interior (Department) has reviewed the Draft Environmental Impact Statement for the proposed Rocky Mountain Front Mineral Withdrawal, Helena, and Lewis and Clark National Forests and has the following comments.

SPECIFIC COMMENTS:

Page 15, Table 3-1: FORECAST FOR FUTURE MINERAL ACTIVITY; page 18, Mineral Activity; and pages C-4 through C-6, Appendix C, FORECAST FOR FUTURE MINERAL ACTIVITY:

There are other variables that need to be considered besides past activity or known reserves in order to calculate rates or probabilities of annual likelihood of mineral activity in the future. According to Singer and Kouda (1999), successful mineral exploration strategy additionally requires: (1) identification of some of the sources of exploration risk and (2) consideration of these risks in the decisionmaking process so that controllable risk can be reduced.

One risk variable is public policy effects. A discussion of the preexisting management plans or actions regarding minerals activity in the area proposed for mineral withdrawal is needed. In the U.S. Bureau of Mines Montana study (Inventory of Land Use Restraint Program), most of the area was classified as unavailable or severely restricted by management action (see ihup.pdf). Their interpretation is consistent with information provided in Table 3-2 on page 29 and map 3-4. A large part of the area has management directions that emphasize their status as a Wilderness Study Area or possible inclusion in the National Wilderness Preservation System (see gap.pdf; this map was developed from the USGS GAP coverage for Montana and shows Wilderness Study Areas). If the historic management plans and directions discouraged minerals activity, then the probabilities calculated in the Draft EIS are harder to interpret. They no longer reflect

Response 1:

The four variables contributing to exploration risk (public policy effects, quality of information, repeated exploration of known mineral occurrences, and new deposit types) are addressed in turn.

Public Policy Effects

There is no question public policy effects mineral activity. The Proposed Action itself is a public policy decision, its effects to exploration risk are outlined in Table 2-1: Status of Mineral Estate. The assertion that the withdrawal area is currently "unavailable or severely restricted by management action" is an interpretation by the U.S. Bureau of Mines not a reflection of actual mineral policy on NFS lands – see Current Locatable Minerals Administration in Appendix C. Amending the likelihood of activity to reflect the variability of perceived (not statutory) management restrictions would be justified only if significant, lasting change in public policy were anticipated. Forest Plan direction is the current public policy for the area and does not address valid existing rights and activities under the mining law; the public policy for mining activity is summarized in Appendix B.

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only the geologic condition but the public policy situation as well. At best, these rates may represent a minimum.

Another risk factor that needs to be discussed is the quality of the information that is available. High-quality geologic maps, geochemical, and geophysical surveys will influence the mineral activity in an area. Better data in this area might affect the rate of future mineral activity.

In addition, looking at sites with known mineralization minimizes risk, and thus these sites are looked at repeatedly. Therefore, the time between indication of mineralization and delineation of a deposit may take decades. It is unclear if the rates of mineral activity in the Draft EIS include these repeated efforts at known sites. The probability of future mineral activity should be higher at those sites than in areas with no known mineralization or past mineral activity.

Finally, addressing how new exploration models and techniques will affect future mineral activity is important. For example, the Muddy Creek area may have been staked for diamonds; yet this was not considered by previous mineral resource assessments of the area. Consideration of new deposit types is not included in your base-rate for future activity.

Page 17, Mineral Resource Potential, first paragraph:

The statement, "potential . . . is usually defined as being low, moderate, high, unknown, or no (none)," refers to the system of potential assessment that was used by the USGS prior to the mid-1980's. More recent studies use a three-part form of assessment that identify permissive areas and give a probabilistic estimate of undiscovered resources (Singer 1993). In some cases, favorable domains are identified within the permissive tracts.

The statement (second paragraph), "There are no identified mineral resources in the project area," appears to be inconsistent with the resource estimate given for the Alice Creek area on page 18 (890,000 tons of mineralized quartzites with 0.1 percent copper and 0.2 percent silver per ton). Conner and McNeal (1988) estimate 3.5 million tons of ore containing over 700,000 ounces of silver in the Rogers Pass area.

Page 18, Mineral Resource Potential:

The USGS has published a mineral resource assessment of the Helena National Forest (Tysdal et al. 1996a). This report has information (permissive and favorable tracts, mineral occurrences, etc.) that should be included in your analysis (see [sedeu.pdf](#); the image on the left is from the Choteau assessment, Earhart et al. 1981; the image on the right is from the Helena National Forest assessment, Tysdal et al. 1996a).

Tysdal et al. (1996b) provide a different description of the sediment-hosted mineralization (green-bed deposits) in the area than the one presented here. Revett-type deposits, which occur within the quartzites of the Spokane Formation, have the highest mineral potential. They are the thickest, the highest grade, and the most laterally extensive. The discussion here and in

Data Quality

The probabilities for success taken from Peters (1987) incorporate the increasing quality and quantity of information generated as an exploration program progresses from reconnaissance to detailed target investigation. Improved data available from either State or Federal mapping programs may influence the selection of a region for further investigation, but such influence would be greatly overshadowed by economic concerns that control exploration spending.

Repeated investigation of known targets

From page 18: "Most of the study area is thought to have no hardrock mineral resource potential. Areas shown as favorable in Maps 3-1 and 3-2 are considered low potential." The repeated interest and recognized mineral occurrences in the Alice Creek and the Elk Creek areas were the basis for considering those areas to be favorable but the interest has not resulted in a showing of resources

New exploration models and techniques

From Appendix C: "More speculative exploration for unrecognized mineral deposits (i.e. the Raptor claims in Muddy Creek) is not ruled out in this forecast. Speculative exploration for unrecognized minerals is expected to have a correspondingly lower probability of leading to development." The Raptor claims were included in the exploration frequency of four operations in forty years. Consideration of increased activity based on the discovery and development of wholly hypothetical new deposit types does not constitute reasonably foreseeable activity that must be considered under NEPA without some evidence or well founded argument for their existence

Response 2:

The wording of this section has been changed to eliminate confusion and be consistent with current USGS mineral-resource assessment terminology.

Response 3:

The section has been revised with a discussion of Revett type stratabound copper-silver deposits and an expanded discussion of other deposit types and mineral occurrences outside the area to the south.

Appendix C should be revised to reflect the information in Tysdal. Discussion of potential development should consider the potential economic viability of Revett-type deposits.

The absence of data on subsurface deposits need not preclude any attempt to determine resource potential. The final EIS should delineate where subsurface resources of these strathound deposits should occur by using the outcrop trace and dips from the geologic map.

Eahart et al. (1981) show that there is known porphyry copper mineralization just outside the southern edge of the area. They also identify an area with inferred mineralization at depth within the area. Iudington et al. (1996) also show a tract for quartz adularia and hot spring gold-silver deposits in the extreme southern part of the area. These areas should be shown on a map and discussed in Chapter 3 (see porphyry.pdf). In addition, an expanded discussion should be in Appendix C on page C-3, OTHER DEPOSIT TYPES.

Page 18, Mineral Demand:

The proposals by Sterling Resources to develop Revett-hosted copper-silver deposits in northwestern Montana needs to be discussed here. The copper-silver mineralization in the area is very similar to those deposits.

Page 18, Mineral Activity and Map 3-3: Proposed Rocky Mountain Front Mineral Withdrawal Lewis and Clark and Helena National Forests, Recent Mining Claim Locations:

There are mineral occurrences in the USGS mineral occurrence databases (Mineral Resources Database System, Minerals Information Location System, and Minerals Availability System; see <http://mrdata.usgs.gov> as well as sources listed below) and the mineral occurrence table from Tysdal et al. (1996) that are not described in the Draft EIS (see occur.pdf). They are:

1. Byrnes Creek copper,
2. Red Rock prospect or claims,
3. Ready Money mine,
4. Lincoln Gulch (Au placer), and
5. Blackbird 1-16 claims.

See claims.pdf for a map showing density of mine claims and location of sections with permits.

Page 25, Effects of Alternative A, first paragraph:

Assuming that the statement, "The forecast for mineral activity . . . assumes that a geologic mapping and geochemical and geophysical surveying program would take place once every ten years," refers to site-specific activity, then systematic mapping, surveying, and sampling programs conducted by the State or Federal Government will not take place that frequently.

Response 4:

The discussion of mineral demand and commodity prices indicates probable trends in exploration spending. The proposal by Sterling Resources to develop identified reserves has significantly different type and level of investment risk than exploration efforts in an area with low mineral potential. Considering the risk associated with mine development is unwarranted, as no identified reserves exist in the withdrawal area.

Response 5:

Mineral occurrences not addressed:

1. Byrnes creek copper and Red Rock prospect: Mineral occurrences reported by Eahart (1977) in the mineral resource assessment for the Scapegoat Wilderness. Mineralized areas are mapped in the 1981 report by the same author, but not discussed in the text. There is no BLM record of any claims in the area.
2. Ready Money mine: BLM Serial No. 48041 is among the claims in the Elk Creek area near Lead Gulch (section 2, T18N R8W).
3. Lincoln Gulch (Au placer): Lincoln Gulch is near the old Lincoln Townsite (T14N R9W)
4. Blackbird 1-16 claims: the Blackbird claims are located south of Manhattan, MT in section 24, T1N R3E.

Response 6:

Correct. Thank you for your comment.

Response 7:

While the Minerals Policy Act and Forest Service Policy speak to encouragement and facilitation of sound mineral resource development, analysis and consideration of other resources are required by the Forest and Rangeland Renewable Resource Planning Act of 1974 as amended by the National Forest Management Act of 1976. Goals and objectives for goods and services established as forest-wide direction may differ from management area direction which applies to a specific parcel of land. The forest plan management decisions seek to reconcile the best mix of this direction.

Response 8:

Blackleaf, Muddy Creek, and the Raptor claims all refer to the same operation.

Response 9:

The assumptions made take into account known data and potential. In the example sited of beartooth or rock creek explorations, helicopter drilling was the culmination of years of previous exploration yielding encouraging findings suggesting increasing favorability for large resources. Contrasted with this area where information to date is not encouraging, an assumption of low potential and an assumption that exploration would use low cost options or the risk would not be taken is reasonable.

Response 10:

The mineral activity forecast (Appendix C) now more thoroughly addresses the sediment-hosted copper deposits in the Spokane Fm. In the Alice Creek area.

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Page 27, Lewis & Clark Forest Plan: Forest-wide Direction

Given the management directions summarized in Table 3-2 (page 29), it is unclear how exploration and development of mineral resources has been facilitated. A discussion of the facilitation is needed.

Page 28, (d) Does the withdrawal area have a high mineral potential or are there nearby mining claims or mining activities?:

It appears that the Blackleaf (page 28) and the Muddy Creek (page 25) areas are the same. Both had 104 claims staked and dropped recently. If so, consistency of naming is needed for clarity.

Page 43, page C-5, Appendix C, Table 3-1: MINERAL ACTIVITY FOR [E] CAST, and page D-1, Appendix D, SUMMARY OF ASSUMPTIONS, Mineral Development Forecast:

In the discussion of the effects of a drilling program, the assumption has been made that (1) a drilling program would require road building and (2) helicopter-support drilling is not cost effective. Supporting documentation or analysis is needed for these assumptions. Helicopter-supported drilling has been conducted routinely at the Stillwater Complex in southwestern Montana since the late 1970's, and there are other mining projects where helicopter-supported drilling has been used and was cost effective.


Page C-3, APPENDIX C, Deposits in the Alice Creek Area:

Revise and update this section with information from Tysdal et al (1996b)

Enclosed Maps

Should you want the electronic (pdf) versions of enclosed maps, please contact me at (303) 445-2500.

Sincerely,


Robert F. Stewart
Regional Environmental Officer

Enclosures



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
 REGION 8, MONTANA OFFICE
 FEDERAL BUILDING, 301 S. PARK, DRAWER 10096
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Ref: 8MO

July 10, 2000

Mr. Rick Prausa, Forest Supervisor
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Re: Draft EIS for the Proposed Rocky Mountain
 Front Mineral Withdrawal EIS-Lewis and
 Clark and Helena National Forests

Dear Mr. Prausa:

In accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, the Environmental Protection Agency, Region VIII, Montana Office (EPA) has reviewed the above-referenced Draft Environmental Impact Statement (DEIS).

The EPA is supportive of the Forest Service's proposal to withdraw from locatable mineral entry, 429,000 acres of National Forest System lands along Montana's Rocky Mountain Front in Glacier, Pondera, Teton, and Lewis and Clark Counties, within the Lewis & Clark and Helena National Forests for a period of up to 20 years. We agree that the preservation of this area for traditional Native American cultural purposes, protection of threatened and endangered species, and preservation of the outstanding scenic values and roadless character has great merit. We note that Glacier National Park is directly north of the study area, and the Great Bear, Bob Marshall, and Scapegoat Wilderness areas are west of the study area, and the Blackfeet Indian Reservation is adjacent to the northeast boundary.

Hardrock mining impacts to water quality, especially from acid rock drainage and metal and nitrogen contamination of surface and ground waters have been a source of significant concern to the EPA. While the DEIS did not focus much on the potential for acid rock drainage and/or metal or nutrient transport or pollution to occur during mineral exploration and development on the Rocky Mountain Front, we believe such water pollution risks are often associated with hardrock mining activities, and that such pollution risks cannot be totally eliminated with the No Mineral Withdrawal Alternative. We agree with the statement in the DEIS (page 28) that the only way to achieve a "no risk" goal is to withdraw the area.



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there is a particular need to protect the public from mining caused water pollution, and to protect the taxpayer from the expense of reclamation and remediation following hardrock mine financial failures. American taxpayers are faced with significant liability for mines left unreclaimed, with the economic burden for mine clean up shifted from the companies that profited from the mines, leaving environmental problems for the public to clean up, including mines in Montana (e.g., Zortman-Landusky Mine in northeastern Montana owned by Zortman Mining Inc., and Pegasus Mining Inc.)

The EPA supports the Forest Service's preferred alternative to withdraw the Rocky Mountain Front study area from locatable mineral entry. The EPA review did not identify any potential environmental impacts requiring substantive changes to the proposal, and we consider the Forest Service's preferred alternative, Alternative B, recommending mineral withdrawal to be the environmentally preferred alternative.

We do recommend that clarification be provided in regard to the 429,000 acres proposed for mineral withdrawal. It is stated on page 1 of the DEIS that the study area consists of approximately 429,000 acres of both private and federal lands, consisting of 424,000 acres of National Forest lands and 5,000 acres of scattered private land. Since we understand that private land would be unaffected by the proposed mineral withdrawal, it is not clear to us why the mineral withdrawal is for 429,000 acres (i.e., including the 5,000 acres of private lands) rather than 424,000 acres of National Forest land? This discrepancy should be corrected.

Another area of clarification that would be helpful regards the apparent contradiction between the statement on page 17 of the DEIS that, "there are no identified mineral resources in the project area," and subsequent statements on page 18 where it is stated that, "within the withdrawal area, anomalous amounts of copper occur in green beds in all Belt Series rocks..."; "the second deposit type of stratabound mineral occurrence consists of lead and zinc (locally containing copper and silver) in calcareous quartzites in the lower part of the predominantly carbonate Helena Formation," and "stratabound copper-silver occurrences have been discovered in the Alice Creek area on the Helena National Forest." The statements describing mineral occurrences on page 18 and elsewhere seem to contradict the statement on page 17 indicating that no mineral resources have been identified in the project area. Perhaps this confusion could be cleared up by stating that no economically developable mineral resources have been identified within the project area.

The EPA appreciates the efforts of the Forest Service to prepare an EIS for this mineral withdrawal project. Based on the procedures EPA uses to evaluate the adequacy of the information and the potential environmental impacts of the proposed action and alternatives in an EIS, the Draft Environmental Impact Statement For The Proposed Rocky Mountain Front Mineral Withdrawal has been rated as Category 1.0 (lack of objections). A copy of EPA's rating criteria is attached.

Response 1:

The acreage for the mineral withdrawal has been adjusted to more accurately reflect the area proposed for withdrawal. The original figure of 429,000 acres for the study area was based on an estimate from the legal description published in the Federal Register. The new figure of 420,000 acres represents acreage calculated from digital land status maps provided by the Montana state Library (NRIS 1996). This area (420,000 acres) is the total acreage within the study area. The lands already withdrawn and private lands total 15,360 acres and are subtracted from the total acreage. This brings the acreage proposed for withdrawal to approximately 405,000 acres. These new figures will be used throughout the document.

Response 2:

The wording of this section has been changed. The description of mineral potential now reflects the probabilistic methods used by the USGS for mineral-resource assessments. The earlier definition classified an area as having "low, moderate, high, unknown or no" potential (USGS Circular 831). The new procedure delineates an area called a "permissive tract" in which mineral deposits of a given type cannot be ruled out based on regional geologic information. A permissive tract reflects development potential in only a limited sense (i.e. mineral development is not impossible). The USGS further delineates "favorable" areas that represent their best guess as to where mineral activity is most likely to occur within a tract.

The EPA appreciates the opportunity to review and comment on the DEIS. If you have any questions please contact Mr. Steve Potts of my staff in Helena at (406) 441-1140 ext. 232.

Sincerely,



John F. Wardell
Director
Montana Office

cc: Cindy Cody/Yolanda Martinez, EPA, 8EPR-EP, Denver
James Dunn, EPA, 8EPR-EP, Denver
Elaine Suriano, EPA, OFA, Washington DC

DISTRIBUTION OF THE FINAL EIS AND SUMMARY

Copies of the Draft EIS were sent to federal, state, and local agencies; Native American tribes; and individuals and organizations. Agencies, organizations and individuals listed below received the Final EIS / Summary.

Elected Officials, American Indian Tribes

US Representative Rick Hill
US Senator Max Baucus
US Senator Conrad Burns
Montana Governor Marc Racicot
Blackfeet Legal Department
Blackfeet Tribal Business Council Chairperson
Blackfeet Cultural Program Cultural Representative
Blackfeet Fish & Game

Agencies and Organizations

Aerie Preserve Conservation Group
Alliance For The Wild Rockies Ecosystem Defense
Ambience International
American Canoe Association
American Lands Alliance
American Wildlands
Asarco
Boulder County Audubon Society
Canyon Coalition Willows Sharon
Center For Environmental Equity
Central Montana Wildlands
Chamber of Commerce Lincoln
Checkerboard Inn
Choteau Acantha
Cold Mountain Cold Rivers
Continental Divide Trail Society
Curley Creek Coalition
Dornberg Maury
Dorsey & Whitney
Ecology Center

Flying Popcorn Ranch
 Fort Lee High School
 Friends Of The West
 Glacier Two Medicine Alliance
 Great Falls Tribune
 Greystone
 High Country Citizen' Alliance
 Highriders Northwest 4 Wheel Drive Assn
 Idaho Conservation League
 Indian Law Resource Center
 Jireh Consulting Services
 John Muir Project
 Kettle Range Conservation Group
 Last Chance Audubon Society
 Last Chance Back Country Horseman
 Macdonald Gold Project
 Marion County Water Watch
 Mineral Policy Center
 Mono County Mining Committee
 Montana Association of Churches
 Montana Bureau of Mines & Geology
 Montana Dept. of Fish Wildlife & Parks
 Montana State Historic Preservatoin Office
 Montana Department of Revenue
 Montana Environmental Information Center
 Montana Mining Assoc.
 Montana River Action Network
 Montana Safaris
 Montana Wilderness Association, Wild Divide
 Helena Area Chapter
 Montana Wildlife Federation
 N.A.T.I.V.E.S.
 National Mining Assoc.

National Wildlife Federation
 Native Forest Network
 Natural Resources Defense Council
 Northwest Mining Assoc.
 Orion
 People For The USA
 Public Employees For Environmental
 Responsibility
 Rock Creek Alliance
 Rosebud Audubon Society
 Salmond Ranch Company
 San Juan Citizens Alliance
 Sierra Club
 Siskiyou Project
 Sublette Riders Association
 Swan View Coalition Hammer Keith
 Sweetgrass Hills Protective Assn.
 The Tree Man
 The Wilderness Society
 Trout Unlimited Montana Council
 US Environmental Protection Agency
 USDI National Park Service, NEPA Section 106
 Specialist
 USDI Office of Environmental Affairs
 Waterton Lake National Park
 Western Land Exchange Project
 WETA
 Wildlands Center For Preventing Roads
 Youngblood-Petersen Tom
 Yellowstone To Yukon
 Yellowstone Valley Audubon

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 Jean
 Stinebaugh, Tom
 Stix, Amy
 Stockmann, Keith
 Stoll, Linda
 Stoltz, Leslie and Jim
 Stone, Robert
 Stone-Manning, Tracy
 Story, Donald
 Stout, Vickie
 Stowe, David
 Strause, Howard
 Strazdas, Maureen and Pete
 Stroble, Margaret
 Struck, Wilf
 Sullivan, Greg
 Sullivan, Timothy
 Sutherland, Meghan
 Swanberg, Linda

Swaney, Jim and Jan
 Swanson, John
 Swift, MD William
 Swoboda, Aaron
 Talcott, Diana
 Tanzer, Claudia
 Tashjian, Randy
 Taylor, Dorothy
 Taylor, John and Joy
 Taylor, Marion and Frank
 Tereskiewicz, Thomas
 Test Test
 Tewehshon'on Ishgooda
 Thaden, Bob and Marilyn
 Thaeler, Marianne
 Thayer, June
 Theophilus, Adrienne
 Thill, Tera
 Thomas, Toni
 Thompson, Donald
 Thompson, Gordon
 Thompson, Kirk
 Thompson, Kristina
 Thompson, Steve
 Thompson, Thomas
 Thompson, Tomas
 Thornton, John
 Thurmen, Stephen
 Tighe, Dennis & Michelle
 Timko, Marge
 Tingle, Walter
 Tipler, Becky
 Toddy Perryman Patrick
 Leonard
 Toigo, Joe & Deborah
 Tollefson, Mrs. Helen
 Tonkyn, David
 Toubman, Sara
 Tracy, Linda
 Trolinger, Charlotte
 Truax, Wayne
 Tucker, Patricia
 Tuma, Gary
 Turk, Larry
 Tuss, Elsie
 Tuttle, Larry
 Tyner, Robin
 Unruh, Jerry
 Vallons, Cheryl
 Van Dyck, Tobi
 Van Every, Marsha
 Van Hyning, Dyrck
 Vanasselt, Wendy
 Vant Hull, Mary
 Vernot, Laurens
 Versocki, James

Vertrees, Gerald
 Vesperman, Gary
 Vice, Daniel
 Vielleux, Steve
 Vignere, Joel
 Virgin, Randy
 Visconti, Ralph
 Vlases, Michael
 Vollertsen, John
 Vonnegut, Ralph
 Voorhies, William and Marilyn
 Vuchetich, Carol
 Wahlstrand, Mark
 Walker, Jeff
 Walker, Scott
 Wallace, Linda
 Wallace, Stephen
 Walling, Catherine
 Walschlager, Gerald
 Walsh, Sara
 Walsh, M.D. Stephen
 Walters, Jean and Clair
 Walters, Richard
 Warble, Steve
 Waring, George
 Waring, Leonard
 Warren, Bonnie
 Watkins, Donna
 Watson, R. Duke
 Watson, Professor Vicki
 Wayburn, Cynthia
 Weber, Gordon
 Weber, Seward
 Webster, Margaret
 Weeks, Cynthia
 Weide, Bruce
 Weisberg, Steven
 Weissman, Irving
 Wells, Roy
 West, Stanley
 Westervelt, Susan
 Whalen, Kim
 Wheeler, Bryce and Wilma
 Whirry, Gordon and Janet
 White, Lornie
 White, Marilyn
 White, Melissa
 White, Randall
 Whitehorn, Wendy
 Wickerham, Mrs. L.J.
 Wickline, Paige
 Wiebe, Kathleen
 Wilcox, Phyllis
 Willard, Dwight
 Williams, Marsha
 Williams, Mart

Willis, Elinor
 Wilshack, Ann
 Wilson, Bob
 Wilson, David
 Wilson, Glen
 Wilson, Helen
 Wilson, Howard
 Wilson, Ron
 Wilson, Vern
 Winestine, Zachary
 Wiper, Mary
 Witcomb, Dick
 Wittman, Erika
 Witucki, Donald
 Wojtalewicz, Brian and Janine
 Wold, Randy
 Wolf, Jonelle and David

Wolfe, Don
 Wolfe, Stephen
 Wolfe, Arthur and Chaffee,
 Holly
 Woodgerd, Wes
 Woods, James
 Wordon, Brenda
 Wright, Anne
 Wright, Denise
 Wright, John
 Wright, Nichole
 Wuerthner, George
 Wyberg, Bryan
 Wyeth, Nathan
 Wynn, Jess
 Yamate, Madeline
 Yeager, Harold and Darlene

Yeager, Michael
 Yellow Kidney, Mrs. John
 "Buster"
 York, Joy
 Young, Brent
 Young, Kim
 Zackheim, Hugh
 Zadis, Peter
 Zane, Janis
 Zebell, Margaret
 Zion, Forrest
 Zipser, Karen
 Zuckerman, Alex
 Zukoski, E
 Zwicker, Marie Louise

RESPONSIBILITIES FOR PREPARATION OF THE EIS

Table 4-1 lists the individuals responsible for preparing this EIS. Table 4-2 lists the preliminary draft reviewers.

TABLE 4-2: LIST OF PREPARERS

Name	Responsibility	Credentials	Years Experience
Dave Whittekiend	Team Leader Wildlife Biologist	BS - Wildlife Biology MS - Botany	11
Bonnie Dearing	Public Involvement	BA - Education, MS - Education Post Grad. - Journalism & Public Relations	25
Anita DeZort	Recreation/Roadless	BS - Agriculture, BS - Agricultural Land Resources, Forest Landscape Architect	14
Richard Newton	Archaeologist	BA - Anthropology, MA - Anthropology	18
Pat Thomas	Landscape Architect	Landscape Architect Degree, Licensed State of MT	25
Jeff Silkwood	Geologist	BA - Geology, MA - Geography	4
Renee Lundberg	Writer/Editor	BS - Botany (Biology Education), MS - Forestry, Region 1 Certified Silviculturist	22

TABLE 4-3: LIST OF PRELIMINARY DRAFT REVIEWERS

Name	Responsibility	Agency
Alan Campbell	NEPA	OGC
Mike Burnside	Minerals	USFS
Robin Strathy	Forest Planning	USFS
Daina Bambe	District Ranger	USFS
Mike Munoz	District Ranger	USFS
Steve Potts	NEPA	EPA
Randy Huisher	Minerals	BLM
Jim Mitchell	Geology	BLM
Don Godtel	Wildlife	USFS
Mark Nienow	Hydrology	USFS

APPENDIX A

FEDERAL REGISTER NOTICE OF PROPOSED MINERAL WITHDRAWAL AND NOTICE OF INTENT TO PREPARE EIS

Federal Register / Vol. 64, No. 22 / Wednesday, February 3, 1999 / Notices

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[MT-924-1430-01; MTM 88993]

Notice of Proposed Withdrawal and Opportunity for Public Meeting; Montana

AGENCY: Bureau of Land
Management, Interior.

ACTION: Notice.

SUMMARY: The U.S. Department of Agriculture, Forest Service, has filed an application to withdraw 429,000 acres of National Forest System lands to preserve the area for traditional cultural purposes by Native Americans, protection of threatened and endangered species, and preservation of outstanding scenic values and roadless character. This notice closes the lands for up to 2 years from location and entry under the United States mining laws. The lands will remain open to all activities consistent with applicable Forest plans and those related to exercise of valid existing rights.

DATES: Comments and requests for a public meeting must be received by May 4, 1999.

ADDRESSES: Comments and meeting requests should be sent to the Forest Supervisor, Lewis and Clark National Forest, 1101 15th Street North, Box 869, Great Falls, Montana 59403.

FOR FURTHER INFORMATION

CONTACT:

Forest Supervisor, Lewis and Clark National Forest, 1101 15th Street North, Box 869, Great Falls, Montana 59403.

SUPPLEMENTARY INFORMATION:

The Forest Service has filed an application to withdraw the following-described National Forest System lands from location and entry under the United States mining laws, subject to valid existing rights:

All National Forest System lands in the Rocky Mountain Division of the Lewis and Clark National Forest outside of existing wilderness east of the Rocky Mountain Continental Divide. This includes Federal lands in part or all of the following townships:

Principal Meridian, Montana
Tps. 16 N., Rs. 7 and 8 W.
Tps. 17 N., Rs. 7 and 8 W.
Tps. 18 N., Rs. 8 and 9 W.
Tps. 19 N., Rs. 9 and 10 W.
Tps. 20 N., Rs. 9, 10, and 11 W.
Tps. 21 N., Rs. 9 and 10 W.
Tps. 22 N., Rs. 9 and 10 W.
T. 23 N., R. 9 W.
Tps. 24 N., Rs. 9 and 10 W.
Tps. 25 N., Rs. 9 and 10 W.
Tps. 26 N., Rs. 9 and 10 W.
Tps. 27 N., Rs. 9 and 11 W.
Tps. 28 N., Rs. 10 to 13 W.
Tps. 29 N., Rs. 10 to 13 W.
Tps. 30 N., Rs. 11, 12, and 13 W.
Tps. 31 N., Rs. 12 and 13 W.

In addition, National Forest System lands on the Lincoln Ranger District of the Helena National Forest east and outside of the Scapegoat Wilderness in part or all of the following townships:

T. 15 N., R. 7 W.
Tps. 16 N., Rs. 6, 7, and 8 W.

The areas described aggregate approximately 429,000 acres in Lewis and Clark, Teton, Flathead, Pondera, and Glacier Counties.

For a period of 90 days from the date of publication of this notice, all persons who wish to submit comments, suggestions, or objections in connection with the proposed withdrawal may present their views in

writing to the Forest Supervisor, Lewis and Clark National Forest.

Notice is hereby given that an opportunity for a public meeting is afforded in connection with the proposed withdrawal. All interested persons who desire a public meeting for the purpose of being heard on the proposed withdrawal must submit a written request to the Forest Supervisor, Lewis and Clark National Forest, within 90 days from the date of publication of this notice. Upon determination by the authorized officer that a public meeting will be held, a notice of the time and place will be published in the **Federal Register** at least 30 days before the scheduled date of the meeting.

The application will be processed in accordance with the regulations set forth in 43 CFR 2300.

For a period of 2 years from the date of publication of this notice in the **Federal Register**, the land will be segregated as specified above unless the application is denied or canceled or the withdrawal is approved prior to that date.

Dated: January 29, 1999.

Thomas P. Lonnie,
*Deputy State Director, Division of
Resources.*

[FR Doc. 99-2636 Filed 2-2-99; 8:45
am]

BILLING CODE 4310-DN-P

DEPARTMENT OF AGRICULTURE

Forest Service

**Rocky Mountain Front Minerals
Withdrawal EIS—Lewis and Clark
and Helena National Forests**

AGENCY: Forest Service, USDA.
ACTION: Notice of intent to prepare
and environmental impact statement.

SUMMARY: The Forest Service will prepare an environmental impact statement on a proposal to withdraw from locatable mineral entry, 429,000 acres of National Forest System lands along Montana's Rocky Mountain Front in Glacier, Pondera, Teton and Lewis and Clark Counties, Montana. Specific land descriptions were provided in the **Federal Register** (64 FR 5311–5312, Feb. 3, 1999) under the Bureau of Land Management Notice of Proposed withdrawal. The purpose of the Proposal is to preserve the area for traditional cultural purposes by Native Americans, protected, threatened or endangered species and preserve the outstanding scenic values and roadless character. If approved, the withdrawal would remove National Forest System lands along the Rocky Mountain Front from new mining claims for up to 20 years. The EIS will be designed to satisfy the requirements of the Federal Land Policy and Management Act of 1976 and implementing regulations (43 CFR 2310.1).

DATES: Comments concerning the scope of the analysis should be received on or before July 6, 1999. See **SUPPLEMENTARY INFORMATION** section for public meeting dates.

ADDRESSES. Send written comments to Rick Prausa, Forest Supervisor, Lewis and Clark National Forest, 1101 15th Street North, Box 869, Great Falls, MT 59403. Electronic mail may be sent to: comment/rl—lewisclark@fs.fed.us. See **SUPPLEMENTARY INFORMATION** section for additional information about electronic filing and public meeting addresses.

FOR FURTHER INFORMATION

CONTACT: David Whittekiend, EIS Team Leader, (406) 466–5341 or (406) 791–7700.

SUPPLEMENTARY INFORMATION: The Forest Service proposes to withdraw from locatable mineral entry, National Forest System lands along

the Rocky Mountain Front. The proposed mineral withdrawal is 429,000 acres of federal lands, subject to valid existing rights associated with the existing unpatented mining claims in the study area. The withdrawal would have an immediate effect on 426,800 acres of currently unclaimed federal land, which would be withdrawn for up to 20 years. The mineral withdrawal may or may not affect the remaining acreage (approximately 2,200 acres of unpatented mining claims), depending upon whether the 104 unpatented mining claims constitute valid existing rights. If these unpatented mining claims were abandoned or determined to be invalid, the mineral withdrawal would prohibit the relocation of new mining claims. The mineral withdrawal would be subject to review at the end of 20 years according to federal regulations. The primary purpose of the proposed mineral withdrawal is to preserve the area for tradition cultural uses by Native Americans, to protect threatened and endangered species and protect outstanding scenic values and roadless character. Many individuals and groups have expressed concern about the potential of minerals development along the Rocky Mountain Front after the staking of 104 claims in the Blackleaf/Muddy Creek area.

The study area includes areas considered sacred to several Indian tribes. Traditional cultural uses that take place in the study area include religious ceremonies and gathering of traditional herbs. The study area provides habitat for several threatened and endangered species including grizzly bear, gray wolf, peregrine falcon, and bald eagle. The risks of mining development to these species include increased roading, habitat destruction and increased human presence. The scenic qualities of the study area are believed by many to be among the best in the nation. These qualities could be degraded by the development of mineral resources. Withdrawal of these lands would ensure that the cultural, biological and scenic resources of these lands would be maintained and the impacts of mining related activities would be reduced.

Decisions To Be Made

The U.S. Department of Agriculture, Forest Service, has filed an application with the Department of the Interior,

Bureau of Land Management to withdraw 429,000 acres of National Forest System lands from locatable mineral entry under the United States mining laws. The Forest Service will prepare an EIS.

The Chief of the Forest Service will have two decisions to make: he will decide whether or not to recommend that the Secretary of the Interior withdraw this area. If the Secretary of The Interior withdraws the area, the Chief of the Forest Service will also amend the Lewis and Clark and Helena National Forest Plans to reflect he change in management of locatable hardrock minerals. The Chief's Forest Plan amendments decisions will be contingent on the Secretary of the Interior's withdrawal decision. The Chief of the Forest Service will submit his decision and the EIS to the Montana State Director, Bureau of Land Management who will submit a recommendation to the Director of the Bureau of Land Management. The recommendation and supporting documentation will then be forwarded to the Secretary of the Interior for a decision. The authority to withdraw lands from mineral entry lies with the Secretary of the Interior. The Secretary will decide which lands, if any, to withdraw, and for how long. The Secretary is limited to a maximum withdrawal period of 20 years. If a withdrawal of over 5,000 acres were approved, the Secretary of the Interior would advise Congress of the withdrawal action being taken. No action is required by Congress to implement a mineral withdrawal. Congress can terminate a withdrawal with a concurrent resolution from the House and Senate within 90 days of the approval of the Public Land Order. At the end of the 20-year period, the withdrawal decision would be reviewed to determine if it is appropriate to extend it. If the Secretary chooses to implement a withdrawal, the withdrawal would become effective on the date the Public Land Order is published in the **Federal Register**.

Responsible Official

Mike Dombeck, Chief, USDA Forest Service, Auditors Building, 201 14th Street, SW at Independence Ave., SW., Washington, DC 20250 is the Responsible Official for making the withdrawal recommendation to the Secretary of the Interior. The Chief of the Forest Service is also responsible for any decision to amend the Forest

Plans to reflect any change in management of locatable hardrock minerals. He will document his decisions and rationale in a Record of Decision.

Preliminary Issues

Two preliminary issues have been identified: Approval of the withdrawal would result in the loss of opportunity to extract minerals from the area and withdrawal would limit the economic base of rural communities along the Rocky Mountain Front.

Public Involvement, Rationale, and Public Meetings

In February 1999, a notice of proposed withdrawal was published in the **Federal Register** (64 FR 5311–5312, Feb. 3, 1999). This notice invited public comment for a period of 90 days. Comments received will be included in the documentation for the EIS. The public is encouraged to take part in the process and is encouraged to visit with Forest Service officials at any time during the analysis and prior to the decision. The Forest Service will be seeking information, comments and assistance from Federal, State and local agencies and other individuals or organizations who may be interested in, or affected by, the proposed action.

While public participation in this analysis is welcome at any time, comments received within 30 days of the publication of this notice will be especially useful in the preparation of the Draft EIS. Public meetings associated with the project will be held to gain a better understanding of public issues and concerns. These meetings will be held in Choteau, Montana at the Stagestop Inn on June 22, 1999 from 3–8 p.m. and in Lincoln, Montana at the Lincoln Community Hall on June 24, 1999 from 3–7 p.m.

Information from the meetings will be used in preparation of the draft and final EIS. The scoping process will include identifying: potential issues, significant issues to be analyzed in depth, alternatives to the proposed action, and potential environmental effects of the proposal and alternatives.

Electronic Access and Filing Addresses

Comments may be sent by electronic mail (e-mail) to comment/rl-lewisclark@fs.fed.us. Please reference the Rocky Mountain Front Minerals Withdrawal on the subject line. Also, include your name and mailing address

with your comments so documents pertaining to this project may be mailed to you.

Estimated Dates for Filing The Draft EIS is expected to be filed with the Environmental Protection agency (EPA) and to be available for public review by January 2000. At the time EPA will publish a Notice of Availability of the draft EIS in the **Federal Register**. The comment period on the draft EIS will be 45 days from the date the EIS publishes the Notice of Availability in the **Federal Register**. It is very important that those interested in the management of this area participate at that time.

The final EIS is scheduled to be completed by August 2000. In the final EIS, the Forest Service is required to respond to comments and responses received during the comment period that pertain to the environmental consequences discussed in the draft EIS and applicable laws, regulations, and policies considered in making a decision regarding the proposal.

The Reviewers Obligation To Comment

The Forest Service believes it is important to give reviewers notice at this early stage of several court rulings related to public participation in the environmental review process. First, reviewers of draft environmental impact statements must structure their participation in the environmental review of the proposal so that it is meaningful and alters an agency to the reviewer's position and contentions. *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 553 (1978). Also, environmental objections that could be raised at the draft environmental impact statement stage but that are not raised until after completion of the final environmental impact statement may be waived or dismissed by the courts. 29991 *Federal Register* / Vol. 64, No. 107 / Friday, June 4, 1999 / Notices *Wisconsin Heritages, Inc. v. Harris*, 490 F. Supp. 1334, 1338 (E.D. Wis. 1980). Because of these court rulings, it is very important that those interested in this proposed action participate by the close of the 45-day comment period so that substantive comments and objections are made available to the Forest Service at a time when it can meaningfully consider them and respond to them in the final environmental impact statement.

To assist the Forest Service in identifying and considering issues and

concerns on the proposed action, comments on the draft environmental impact statement should be as specific as possible. It is also helpful if comments refer to specific pages or chapters of the draft statement. Comments may also address the adequacy of the draft environmental impact statement or the merits of the alternatives formulated and discussed in the statement. Reviewers may wish to refer to the Council on Environmental Quality Regulations for implementing the procedural provisions of the National Environmental Policy Act at 40 CFR 1503.3 in addressing these points.

Dated: June 1, 1999.

Paul Brouha,
Associate Deputy Chief:
National Forest
[FR Doc. 99–14223 Filed 6-3-99; 8:45 am]

BILLING CODE 3410-11-M



APPENDIX B

PERMITS, LICENSES AND APPROVALS FOR MINING-RELATED ACTIVITIES

Mining-related activities on federal lands would be subject to surface management regulations described in 36 CFR 228 subpart A and other state and federal laws. The authorities and the general purpose for the various permits, licenses and approvals required for mining-related activities are listed below by agency.

Bureau of Land Management

- General Mining Law of 1872: Is the basis for appropriation of hardrock mineral resources on public lands. All public domain federal lands that are not specifically excluded from availability are open and available for mineral exploration and development.
- Mining and Mineral Policy Act of 1970: The purpose is to foster and encourage private enterprise in the "orderly and economic development of domestic mineral resources, reserves, and reclamation of metals and minerals".

Forest Service

- Organic Administration Act of 1897 (16 USC 551 & 478): All activities associated with mining must be conducted in accordance with all federal, state and local laws and regulations governing mining operations and environmental protection.
- Mining and Mineral Policy Act of 1970: Same as Organic Administration Act.
- Surface Management Regulations (36 CFR 228 Subpart A): Allows mineral exploration and development on federal land by incorporating management requirements to minimize or eliminate effects on other resources, to assure compliance with state and federal environmental resource standards and criteria, to coordinate with other governmental agencies and to ensure all reclamation activities meet appropriate guidelines.

Montana Department of Environmental Quality

- Montana Mine Reclamation Act, including reclamation bond and monitoring plans: Allows mining while providing for subsequent beneficial use of reclaimed lands, requires sufficient reclamation funding at time of mine closure or abandonment and assures compliance with state and federal environmental resource standards and criteria.
- Open Cut Permit Act: Allows for the excavation of pits while requiring a reclamation plan and bond.
- Montana Clean Air Act: Controls emissions of more than 25 tons per year of particulate matter.
- 401 Certification (Sec. 401, Federal clean Water Act; Administrative Rules for Montana): Required prior to U.S. Corps of Engineers being able to issue a 404 permit; applicable to all federal activities which result in a discharge to state waters,
- Montana Pollutions Discharge Elimination system Permit (MPDES): Controls discharge of (including storm water runoff) to surface waters by setting water quality limitations and requiring self-monitoring.

U.S. Environmental Protection Agency

- Agency has review and approval authority for various programs including 404 permits (Section 309 of the Clean Air Act, Clean Water Act; other environmental statutes).

U.S. Army Corps of Engineers

- Section 404 of the Clean Water Act: Controls discharge of dredged or fills material into waters or wetlands of the United States, including intermittent streams.

U.S. Fish and Wildlife Service

- Section 7, Endangered Species Act, Migratory Bird Act: The purpose is to protect and conserve threatened or endangered species by protecting the ecosystem or habitat they depend on.

Montana State Historic Preservation Office

- Section 106 of the National Historic Preservation Act (39 CFR Part 800): Mitigates impacts on sites eligible for nomination to the National Register of Historic Places.

Montana Department of Environmental Quality

- Montana Water Use Act: Applies if activities would use or extract, through surface water diversion or ground water withdrawal, state water in an amount exceeding 100 gallons per minute.
- Montana Metal Mine Reclamation Act: Requires land disturbed by mining to be stabilized and reclaimed to prevent surface water degradation.

Montana Department of Commerce, Montana Hard Rock Mining Impact Board and "Affected" Local Government Units

- The Montana Hardrock Mining Impact Act: Provides for the mitigation of local government impacts that result from the construction and operation of new large-scale hardrock mineral development.
- The Property Tax Base Sharing Act: Mitigates impacts to municipalities, counties or school districts in which the mineral development is not located by sharing tax base revenues.

County Conservation Districts

- National Streambed and Land Preservation Act: Provides recommendations and consultation for activities that physically alter the bed or banks of streams.

APPENDIX C

FORECAST FOR FUTURE MINERAL ACTIVITY

This mineral activity forecast estimates the probability for future locatable (hardrock) mining and exploration within the boundaries of the proposed Rocky Mountain Front Mineral Withdrawal.

The forecast presents the type and level of locatable mineral activity that may take place in the absence of a withdrawal: the Lewis and Clark and Helena National Forest Plans allow for claim staking, exploration, and mining under the General Mining Law of 1872, and other applicable laws and regulations. The likelihood of exploration and development in the next 20 years, shown in Table C-1 (and 3-1), is based on the potential for undiscovered mineral resources, the type and level of prior activity on the Rocky Mountain Front, and the probabilities for development taken from mining industry statistics on the success rates of exploration projects.

Current Locatable Minerals Administration

General Mining Law of 1872

Under the mining law, a U.S. citizen has a statutory right of access to unappropriated and unreserved federal lands for mineral prospecting, exploration, development and extraction of locatable minerals.

All National Forest System lands which: 1) were formerly public domain -- meaning they have always been in Federal ownership, 2) have not been appropriated, withdrawn, or segregated from location and entry, and 3) have been or may be shown to be mineral lands are open to prospecting for "gold, silver, cinnabar, lead, tin, copper, or other valuable deposits."

Mining and Mineral Policy Act of 1970

It is the policy of the Federal Government, in the national interest, to foster and encourage private enterprise in "the orderly and economic development of domestic mineral resources, reserves, and reclamation of metals and minerals."

Organic Administration Act -- Surface Management Regulations (36 CFR 228, Subpart A)

The Organic Administration Act of 1897 (16 U.S.C. 551 & 478) is the basic authority for the Forest Service surface management regulations (36 CFR 228, Subpart A) whose purpose is "to set forth rules and procedures through which use of the surface of National Forest System lands in connection with operations authorized by the United States mining laws (30 U.S.C. 21 - 54), which confer a statutory right to enter upon the public lands to search for minerals, shall be conducted so as to minimize adverse environmental impacts on National Forest System surface resources."

The regulations establish requirements with respect to protection of air and water quality, scenic values, fisheries and wildlife habitat, and requirements for solid waste disposal, road maintenance, public safety, and reclamation. The regulations require claimants to submit a plan of operations for activities that are likely to cause a significant disturbance of surface resources and post a reclamation bond.

Montana Metal Mine Reclamation Act

The Forest Service works cooperatively with the Montana Department of Environmental Quality (MDEQ). The MDEQ administers the Montana Metal Mine Reclamation Act, the purpose of which is to prevent land and surface water degradation by requiring lands disturbed by mining to be stabilized and reclaimed. The Act

requires an approved operating permit for all mining activities, which disturb more than five acres or mine more than 36,500 tons of ore annually.

MINERAL POTENTIAL

The forecast is based on the possibility of undiscovered mineral resources existing within the 429,000-acre withdrawal area. Because there are no known locatable mineral reserves within the withdrawal area, hardrock mineral activity on the Rocky Mountain Front is limited to the exploration and development of such undiscovered mineral resources. The geologic data used do not prove whether mineable mineral deposits are present or absent, only the degree to which the environment (lithology, geochemistry, geologic history and tectonic setting) matches a conceptual model called a "deposit model" for a particular mineral deposit type.

A three-step procedure for estimating undiscovered mineral resources is described in the *Assessment of Undiscovered Mineral Resources in the Pacific Northwest: A Contribution to the Interior Columbia Basin Ecosystem Management Project* (USGS, 1996 p. 11). Briefly:

- For each deposit type a map showing "permissive tracts" (areas where the geologic setting is consistent with that of a particular deposit model¹) is delineated
- A team of experts makes an estimate of the number of undiscovered deposits expected within the permissive tract for that deposit model²
- The estimates of all the types and numbers of deposits in an area are combined with grade and tonnage models in numerical simulation³ to produce a "probability distribution of the quantities of contained metal in undiscovered deposits" (Ibid. p. 12)

Geologic and geochemical data, along with known prospecting and exploration activity are used to further delineate "favorable areas" where exploration and development are most likely to occur within the permissive tract.

Stratabound Deposits

Within the proposed withdrawal area, the geologic setting is consistent with two stratabound metallic mineral deposit types associated with Proterozoic rocks in the Belt series. The sediment-hosted copper deposit type (Cox, 1986 Model 30b) consists of disseminated deposits of copper and silver sulfides in "green-beds" in alternating sequences of red (oxidized) and green (reduced) quartz arenites and argillites. Map 3-1 shows permissive tracts and favorable areas for sediment-hosted copper deposits. The sandstone-hosted lead-zinc type (Cox, 1986 Model 30a) consists of disseminated lead and zinc minerals (galena and sphalerite) in

¹ From the *Assessment of Undiscovered Mineral Resources in the Pacific Northwest: A Contribution to the Interior Columbia Basin Ecosystem Management Project* (Box et. al. 1996 p. 11):

Mineral deposits sharing a relatively wide variety and large number of attributes are characterized together as a "type", and a model representing that type is developed. The model summarizes the geological environment of the deposit and the identifying characteristics of the mineral deposits themselves. If production and reserve information are available from enough known deposits of a given type, statistical models of the tonnage and grade (amount of a commodity expressed as a percentage by weight of the host rock) of these deposits are developed. Using the grade and tonnage models, the probable size and grade of undiscovered deposits can be statistically inferred.

² The experts make their estimates at several "confidence intervals"-- 90% chance of X or more deposits with a grade and tonnage distribution similar to that in a given grade and tonnage model, and similarly at 50%, 10%, 5%, and 1% (Ibid. p 12) taking into account the grade and tonnage of the model, the quality and quantity of available geologic data, and previous exploration in the area.

³ USGS "MARK3 simulation" -- like the "Magic 8-ballTM" but more complicated and much more expensive.

calcareous quartzites. The mineralization may locally contain copper and silver⁴. Map 3-2 shows permissive tracts and favorable areas for sandstone-hosted lead-zinc deposits.

Sediment-hosted Cu deposits

This deposit model (Cox, 1986) has been subdivided into three models with "different geologic features, grades and tonnages, and anticipated environmental effects associated with mining and processing." (Lindsey et. al. 1995): deposits in widespread reduced facies (RF) sedimentary rocks (e.g. White Pine, MI); deposits in local areas of reduced rocks in redbed (RB) sequences (e.g. Nacimiento, NM); and deposits in the Proterozoic Revett Formation (e.g. Spar Lake, MT). Table C-1 illustrates the tonnage and grade differences in the three model types.

Along the southwestern edge of the withdrawal area, "green-bed" type deposits occur in greenish to gray quartzites, siltites, and argillites in sequences of alternating reduced (green) and oxidized (red) beds in the McNamara, Empire, and Spokane Formations of the Belt Supergroup. Sulfide mineralization in glauconite rich quartzites of the McNamara Formation contain as much as 1.5% copper (Cu) and .32 oz/ton silver (Ag), but are given a low potential for submarginal (not presently economic) resources because the deposits are small and discontinuous (Earhart et. al. 1981). The Empire Formation is predominantly a green-bed unit and copper minerals including bornite and chalcocite occur locally in stratabound zones about a meter thick. Earhart and others (1981) estimate grades of around 0.15% Cu and 0.07 oz. / ton Ag in the Empire Fm. In his assessment of redbed (RB) type copper deposits in the Pacific Northwest, Zientek (1996) relates these "green-bed" deposits to the redbed (RB) model and reports that no known deposits of this type exist in the permissive tract "although numerous prospects and occurrences are known."

"Green-bed" deposits in the upper part of the Spokane Formation are estimated at 0.1% Cu and 0.25 oz./ton Ag and are thought to have a higher potential for submarginal mineral resources than the younger units of the Belt as they are more laterally continuous and have a higher silver content (Earhart et. al. 1981). Disseminations and fracture fillings of sulfide minerals in light-gray quartzite and siltite lenses in the Spokane Formation have been compared to the Revett type (RV) deposits (Tysdal et. al. 1996b, Zientek et. al. 1996). The Spokane Fm. deposits in the withdrawal area have roughly similar host rocks, geologic environment, and ore mineralogy as the Revett type, but are thinner, lower grade, and less laterally extensive. Describing the quartzites in the Alice Creek area, Earhart and others, (1981) report "outcrops typically form ledges that are rarely more than 2m thick and range from a few tens of meters to nearly 1000m along the strike." In a broad swath across Alice Creek between Green Mountain and Silver King Mountain, Earhart and others (1981) estimate 800,000 tonnes of mineralized rock in the Spokane Fm. containing an average of 0.1% Cu and 0.2 oz/ton Ag. The only known production in the withdrawal area is from one small pod-shaped silver ore deposit at the Bear Gulch mine that contained about 200 tons averaging 70 oz./ton Ag (Earhart et. al. 1981).

The estimated grades and tonnages of identified copper and silver occurrences in the withdrawal area are not presently economic. Estimates of grade and tonnage for sediment-hosted Cu mineralization in the Spokane Fm. southwest of the withdrawal area (the Monture Creek – Alice Creek Area shown in Table C-1) are within the size range of known Revett deposits, but the copper and silver grades are lower.

The Spokane Fm. sediment-hosted copper mineralization in the withdrawal area is considered to have a low potential for development. Identifying these rocks as an exploration target hinges on the assumption that the mineralization is both more laterally extensive than presently reported in the area and higher grade than has been reported for occurrences elsewhere in the Spokane Formation.

⁴ Earhart and others, (1981) report chalcopyrite and an unidentified silver mineral in a sample taken near the Landers Fork in the Scapegoat Wilderness just north of the withdrawal area.

Table C 1: Estimated median and maximum tonnages and copper grades for Sediment-hosted Cu deposit models and occurrences in the Spokane Formation

Deposit Model	Number of deposits in model	Median size (million tonnes)	Copper Grade (percent)	Silver Grade (g / tonne)	Maximum Size (million metric tons)	Grade of maximum tonnage deposit
Model 30b	57	22	2.1	23 ⁵	1500	1.5
Reduced Facies (RF)	43	32	2.3		2,600	>2
Redbed (RB)	17	0.12	2.8		10	0.67
Revett (RV)	7	19	0.86	40	147	0.68
Occurrence	Number	Size	Copper Grade	Silver grade		
Alice Creek – Bear Gulch	1	0.8	0.1	5.7		
Monture Creek – Alice Creek Area ⁶	1	3.5 ⁷	0.1	7.1		

Sandstone-hosted lead-zinc

Stratabound deposits of lead (Pb) and zinc (Zn) minerals (occurring as galena and sphalerite) in calcareous quartzites at the base of the Helena Formation are generally less than a half meter thick (in the Wood Canyon area the quartzite is as much as 2.3m thick). The mineralized zones are planar or lenticular and contain less than 1% combined lead and zinc (Earhart et. al. 1981). Hydrothermal Pb-Zn deposits that occur as fracture fillings, disseminations, and pod-like replacement deposits in mostly Cambrian and Devonian-age rocks (Mudge et al. 1968) are likely related to the stratabound occurrences (Leinz and Grimes 1980; Earhart et al. 1981).

Map 3-2 depicts favorable areas for surface or near surface submarginal lead-zinc deposits within the Proterozoic age Helena Formation. The known occurrences are not presently economic (Earhart et. al. 1981). Worldwide, lead and zinc grades varying from 0.4% to 6% Pb (median 2.2%) and 0.025% to 7% Zn (median 0.23%) were mined from sandstone hosted lead - zinc deposits ranging in size from approximately 100,000 tons to 300 million tons (Cox et. al. 1986). This compares to less than 1% combined Pb-Zn for samples taken in the project area.

Other Deposit Types

Southeast of the study area copper has been mined from Eocene age porphyritic monzonites of the Mike Horse Stock in the Heddleston District. Dikes and small stocks of monzonite and quartz monzonite porphyry crop out along a roughly west-northwest trend toward Red Mountain west of Indian Meadows. Based on this

⁵ Roughly 20% of the deposits produced silver with grades ranging from 1 g / tonne to 154 g / tonne. (Singer et. al. 1993)

⁶ A 30 mile trace southwest of the withdrawal area and north of Hwy 200 running from Monture Creek in the west to Alice Creek in the east.

⁷ Earhart and others (1981) generated this figure by "assuming a continuous mineralized zone with a specific gravity of 2.7 that averages 1.5m thick and extends down dip for 100m" along an 88km strike trace of the Spokane Fm. south of the withdrawal area.

outcrop trace combined with geochemical and geophysical data (Earhart et. al. 1981, Leinz and Grimes, 1980a, 1980b), Earhart and others (1981) speculate that porphyry copper deposits may occur at depth in the southern end of the withdrawal area. A similar combination of geochemical and geophysical evidence collected between Gibson Reservoir and Deep Creek: a "geochemical anomaly is superimposed on a bend in a negative magnetic anomaly . . . and on a negative gravity anomaly" led Earhart and others (1981) to speculate the presence of a "buried molybdenum-bearing porphyry deposit, although no intrusives, veins, or hydrothermal alteration features are exposed" (Earhart et. al. 1981).

In the Indian Meadows RNA (southwest corner of the withdrawal area) the USGS outlines permissive tracts for quartz adularia and hot spring gold-silver deposits related to the Lincoln volcanics to the south (Luddington et. al. 1996). Two significant epithermal vein type deposits occur in the nearby Seven-Up Pete district: the Seven-Up Pete quartz adularia vein deposit and the McDonald Meadows disseminated hot spring gold -silver deposit (Frishman, 1996). Tuff associated with the volcanics of Crater Mountain is mapped in the withdrawal area near the southwest boundary (Whipple et. al. 1987). No gold deposits have been reported anywhere in the withdrawal area.

MINERAL ACTIVITY

Deposits in the Alice Creek Area

Stratabound Cu-Ag deposits in light-gray quartzite lenses in the middle part of the Spokane Formation occur in the Alice Creek area on the Helena National Forest. U.S.G.S. geologists estimate a minimum 800,000 tons of mineralized quartzites are exposed on the surface and continue to a shallow depth (Earhart et. al. 1981). Fracture fillings and disseminations of sulfide minerals give the quartzites an average of 0.1 percent copper and 0.2 oz. Ag per ton (Earhart et. al., 1981).

Although no production values are known for the Bear Gulch Mine, also called the Adele or Alyce Creek mine, it has been the target of repeated exploration efforts, starting with the Bear Creek Mining Company in the early 1960s. Bear Creek reported a small pod-shaped silver deposit of approximately 200 tons with average silver values around 70 oz. per ton. Exploration efforts continued into the early 1990s in the area. Most notable was a program of trenching in the roadbed carried out by Noranda Exploration.

North of Cadotte Pass and just adjacent to the National Forest boundary, (sec. 30 T.16N. R.6W.) is the Copper Bowl mine. It is purported to have been a vein deposits associated with Proterozoic sills. No commodity production values are known (Earhart et. al. 1981).

Deposits in the Elk Creek Area

Hydrothermal fracture fillings and replacement deposits of lead and zinc occur in a variety of rocks, mostly Cambrian and Devonian age, and are possibly associated with the Eldorado thrust fault (Earhart et al 1981).

Shafts and prospect pits in the area of the Elk Creek Ranch (sec. 2, T18N, R8W) were excavated over a number of years by George White, an early settler (Holcombe, 1963). Claims were staked in Lead Gulch in 1970. More prospect pits and a short adit were excavated. No record of any production has been recorded and the claims were abandoned by 1978.

Deposits along Gibson Reservoir (Lange Creek)

Mineral seeps deposited a layer of melanterite, a hydrous ferrous sulfate used as a medicinal agent in the early part of the century, on rocky outcrops near Lange Creek. The deposit was not so much mined as

scraped off the rocks. The Mountain Chief and Chief of the Mountain claims were well developed with a cabin a blacksmith shop, leach tanks and a pack trail, and were patented in 1910 (Fullbright 1996).

Deposits in the Wood Creek Area

In the Wood Creek area, hydrothermal lead - zinc deposits occur in Paleozoic rocks, similar to those found in the Elk Creek area. In addition, stratabound lead - zinc occurrences are found in calcareous quartzite of the Helena Formation in this area (Earhart et al, 1981).

The Duval Corporation's Big Banana project involved some 80 claims staked along Wood Creek Hogback in 1974. Exploration consisted of constructing about 3 miles of road and drilling three core holes in the roadbed. The project and claims were abandoned in 1976.

Deposits in the Muddy Creek Area

Mark Alldredge staked 104 claims covering close to 2,000 acres of Paleozoic sedimentary rocks in the Muddy Creek drainage in 1996. Although the area had no previously recognized mineral potential (Earhart et. al. 1981), exploration efforts consisting of soil sampling and geophysical surveying using handheld equipment were carried out through 1997. The claims were abandoned in September of 1999.

The area has no previously recognized mineral potential and the claimant declined to provide information on exploration targets. Rumor of diamonds surfaced following the discovery of diamonds in the Hinton area of Alberta, Canada, but no evidence of similar geologic setting or occurrences are known for this area.

COMMODITY MARKETS

Lead-zinc and copper-silver mineralization is recognized within the withdrawal area. Appendix I outlines the predicted supply and demand for these commodities and discusses the expected industry interest in exploration and development. In summary, interest in lead-zinc deposits is predicted to be marginal. Interest in copper-silver deposits is nearly non-existent. More speculative exploration for unrecognized mineral deposits (i.e. the Raptor claims in Muddy Creek) are not ruled out in this forecast. Speculative exploration for unrecognized minerals is expected to have a correspondingly lower probability of leading to development.

FORECAST SUMMARY

There are presently no unpatented mining claims within the proposed withdrawal area. The low level of past mineral activity in the withdrawal area has resulted from the absence of identified reserves and the low potential for locatable mineral resources.

Only four exploration projects have taken place in the last 40 years. The likelihood of future minerals activities is projected using past levels of mineral activity as an indicator. As noted by Peters (1987, page 536), "out of several hundred favorable sites for ore mineralization examined by geologists, one is likely to become an ore-body." Statistics from the International Atomic Energy Agency show that "investigation of 100,000 anomalies in the United States has resulted in 4,000 prospects among which 700 were classed as deposits" (Peters 1987, page 537). Cominco Ltd. (Peters 1987) and Bear Creek Mining Co. (Peters 1978) reported similar overall success rates of 0.7%. Using these frequencies as a baseline, Table C-2 shows estimates for the probability of each of successive stage in mine development.

TABLE C-2: MINERAL ACTIVITY FORECAST

Activity	Probability in a Given Year	Effects
Prospecting, claim staking, geochemical and geophysical surveying	1 in 10 (based on past activity on RMF and from Peters)	<ul style="list-style-type: none"> ▪ small pits dug to sample material; field geochemical sampling ▪ access usually along existing routes or cross-country ▪ geophysical surveys using hand-held equipment
Exploration Drilling or trenching	5 in 100 (two of the exploration efforts in the last 40 years on the RMF involved drilling or trenching)	<ul style="list-style-type: none"> ▪ access requirements most likely road building for truck mounted drill rigs, equipment (i.e. water trucks, sump tanks) and people ▪ for mineralization near the surface, trenches may be dug with an excavator or backhoe
Detailed Drilling	less than 1 in 1,000 (from Peters)	<ul style="list-style-type: none"> ▪ highly dependent upon the particular ore target sought, several tens to hundreds of drill holes, most often connected by roads ▪ helicopter supported drilling was done in the Cabinet Mountains Wilderness, although it is not generally cost effective ▪ estimate that 20 drill holes + access = 4 acres of disturbance (from Cooke City EIS)
Further Development, including bulk removal of several tons of material for testing or mine construction and production	less than 7 in 10,000 (from Peters)	<ul style="list-style-type: none"> ▪ unable to reliably predict -- entirely dependent upon the type and scale of mine

Exploration is forecast to take place intermittently for the projected future. A one or two year program of claim staking, geologic mapping and geochemical and geophysical surveying is projected to occur once every ten years. This type of activity would result in negligible surface disturbance. The forecast for industry interest in base metals exploration (marginally favorable for lead-zinc deposits, unfavorable for copper-silver deposits) suggests the type and frequency of mineral activity is unlikely to increase over historic levels.

The forecast probability of an exploration drilling project occurring once every twenty years reflects the general probabilities listed by Peters (1987) and represents industry estimates compiled for areas of high and moderate mineral potential. The "low potential for submarginal resources" (Earhart et. al. 1981) in the inferred favorable areas of the Rocky Mountain Front, Maps 3-1 and 3-2, implies an even lower expected probability for development subsequent to geochemical and geophysical surveying. The previous hard rock drilling project in the withdrawal area was three core holes drilled along several miles of roadbed during the mid-1970s. A foreseeable drilling program would most likely be of similar extent using a portable track-mounted or buggy mounted drill rig. Depending on available access, some helicopter support might be expected. Exploration

drilling averaging 20 holes could be considered to result in four acres of surface disturbance including access (Cooke City EIS, Appendix B, p. B-7).

The probabilities given for detailed drilling and mine development reflect the general likelihood for activity reported by Peters (1987). No attempt has been made to quantify the effect factors such as political climate or public opposition to mining might have on the attractiveness of the area for industry investment in mine permitting and development. The low probability for detailed drilling or development and the complete dependence of the project scope and size on the ore deposit make reliable predictions of the surface disturbance from development activity impossible beyond suggesting that surface impacts and access needs will increase (see Appendix D, Summary of Assumptions).

APPENDIX D

SUMMARY OF ASSUMPTIONS

The following assumptions were used as a basis for predicting environmental consequences of each alternative. These assumptions are based on the mineral development forecast in Appendix C and Table C-1 and reasonably foreseeable activities planned within the study area.

Mineral Development Forecast

Prospecting and exploration actions for a preliminary or speculative effort would include claim staking, soil sampling, geophysical exploration, and if warranted trenching or core drilling.

Promising mineralization shown in core samples or pits would result in detailed drilling program to delineate an ore body requiring much more access, most likely drill roads. Depending on terrain, helicopter serviced drilling, like occurred in the Cabinet Mountains Wilderness in the 1970's, may be a reasonable option.

Mine development in general involves further drilling, bulk sampling to determine mill feed, the excavation of shafts and adits, and improving infrastructure (access, power, mine and mill site preparation, and communications). The scope and scale of all actions and therefore their potential effects would be determined by the ore body size and grade. For a small operation power requirements could be as simple as fuel storage for an on site generator. A very large operation would likely require the installation of a powerline.

Production and reclamation stages of a mine are intricately bound to the specific site, ore body and mine plan. Estimated environmental effects are limited to two broad generalizations: 1) increased surface disturbance (mining by underground or surface methods, disposal of waste rock, ore dressing and transporting men, material and equipment) would occur, and 2) there would be increased requirements for infrastructure (access, power, communications, employee residency, etc.).

Other Reasonably Foreseeable Activities

Recreation Use and Trends: Recreation use within the study area would continue to increase. The Lewis & Clark Bicentennial will dramatically increase recreation use (for next 2-5 years) and necessitate recreation improvements in Alice Creek (e.g. trailhead expansion). Other reasonably, foreseeable activities include: routine trail maintenance and reconstruction, continued outfitter and guide use, continued maintenance of campgrounds and trail heads, increased campground use, and limited expansion of resorts and a ski area.

Roads: No new roads are planned within the study area. Existing roads will be maintained and improved. Travel planning and the roadless initiative could change existing access.

Timber Harvest: There are no timber sales planned within the study area. Some timber harvest and timber stand improvement activities are likely in the future.

Oil and Gas Leasing: Oil and Gas EIS's have been completed for both of the Helena and Lewis & Clark Forests. The decision for the Lewis & Clark Forest portion of the mineral withdrawal was no leases. This decision is now under litigation. The decision for the Helena Forest portion was no surface occupancy. Several leases are still valid in the study area. These include proposed well sites in the Blackleaf, Goat Mountain and Hall Creek areas. All three of these proposals are currently in suspension.

Prescribed Burns: There are several prescribed burns planned within the study area. A 10,000 acre prescribed burn in the wilderness adjacent to the study area is in the planning stage. The Forest Service burns an average of 1000 acres annually within or adjacent to the study area.

Grazing: Grazing will continue on existing allotments and range improvement projects (e.g. riparian fencing) are likely to occur.

Wildlife Management: A decision on whether or not to list the Canada lynx under the Endangered Species Act is expected by March.

APPENDIX E

CONSEQUENCES OF MINING-RELATED ACTIVITIES

HERITAGE RESOURCES

Consequence	Pictographs	Lithic Scatter	Traditional Cultural Properties
Negligible	No exploration or impacts.	Exploration has no assoc. ground disturbance.	Exploration activities do not occur, conducted in areas known to be devoid of cultural resources.
Low	Exploration access routes enhance site visibility.	Exploration activities enhance site visibility.	Activities are not ground disturbing and are conducted in areas of low potential to contain cultural sites.
Moderate	Exploration activities result in vandalism to pictographs.	Exploration activities result in illegal artifact collection.	Activities result in limited or localized ground disturbance; secondary impacts may occur
High	Exploration activities result in damage to pictographs.	Exploration activities result in illegal site excavation or enhance site erosion.	Activities result in extensive or broad ground disturbance; activities occur in high site density area's
Extreme	Exploration activities destroy pictograph.	Exploration activities directly impact site(s).	Activities result in ground disturbance at locations containing documented cultural sites.

HERITAGE RESOURCES

Consequence	Historic Mines	Historic Trails	Historic Cabins
Negligible	Exploration does not occur at or near historic mines.	No exploration; or exploration does not occur near historic trails.	Exploration does not occur at or near historic structures.
Low	Minimal testing of waste rock at site.	Exploration activities occur on or near a trail but are not ground disturbing.	Exploration impacts site setting or enhances site visibility.
Moderate	Modification of existing mine structures during exploration.	Exploration activity causes trail erosion or other impacts.	Exploration results in vandalism to site.
High	Large % of waste rock removed for testing or new excavation at mine site.	Exploration activity impacts site setting.	Exploration activities impact site setting.
Extreme	Removal of structure(s) to facilitate mine reopening or exploration.	Exploration activities destroy historic trail.	Exploration activities adversely affect site(s).

WILDLIFE & SENSITIVE PLANTS

Consequences	Habitat	Mortality	Disturbance
Negligible	No change	No change in Mortality	None
Low	Minor modification	No change in population.	Limited
Moderate	Localized short-term modification.	Population limited.	Localized, longer-term.
High	Widespread long-term modification	Population decreased.	Widespread, season-long.
Extreme	Severe, irreversible	Population eliminated.	Range wide, year-round.

VISUAL RESOURCES

Consequences	Settings	Scenery Activities	Scenery Levels
Negligible	No change to scenery settings across the front.	No interruption to Viewing scenery.	No change to SIL.
Low	Visible changes appear natural as seen from roads, trails, & viewpoints or use areas. Disturbance/use apparent from dispersed views is small in scale and subordinate to the natural appearing surroundings.	A few dispersed motorized users may be displaced from areas where they expect to travel or camp off of roads and trails.	All lands remain in same SIL
Moderate	A road may be constructed. A few miles of motorized trail may become temporary or low standard road. Some available dispersed use areas could become dedicated to another use. Visible changes are nearly natural appearing (subordinate) as seen from Highways, roads, motorized trails & use sites. Disturbances are expected to be small in scale and subordinate to the natural appearing surroundings. No change in scenery settings is expected within wilderness areas.	A few areas may be subject to change and those viewing scenery may be displaced to other areas.	All lands remain in same SIL.
High	If any area became less natural and more developed overall. The previous SIL setting would be diminished and some of the areas may have deviations that strongly dominate the valued landscape character. The changes maybe of such size, scale or edge effect that would be outside the character of the landscape being viewed.	Many areas may be subject to change and those viewing scenery would move on to other areas or accept a different type of experience.	Site specific SIL changes: VH->H, H->Mod, Mod->Low, V.Low->unacceptable
Extreme	A highly modified appearing motorized development in a previously rated Slightly altered/Unaltered SIL setting, accessed by a high standard road and occupied by several people year long. Deviations are extremely dominant and borrow little from the natural form, line, color, texture, pattern, or scale of the landscape character. Changes possibly evident from Hwy 89 or 287.	Scenic integrity of the area would change significantly. A large number of recreationists and possibly residents maybe displaced form the area. Users move to other areas of the Front or BMWC and social encounters increased in the new areas.	Site specific SIL changes: VH->Mod, H->Low, Mod->V.Low, Low ->unacceptably low

RECREATION RESOURCES

Consequences	ROS: Recreation Settings	Recreation Activities	ROS Class*
Negligible	No change to recreation settings across the front.	No interruption to recreation activities.	No change to ROS.
Low	RN & SPM: Visible changes appear natural as seen from roads, trails & recreation use sites and areas. Disturbance/use apparent from dispersed views is small in scale and a subordinate to the natural appearing surroundings. No new sounds or smells. SPNM & P: No change in these recreation settings.	A few dispersed motorized users may be displaced from areas where they expect to travel or camp off of roads and trails.	All Lands remain in same ROS class.
Moderate	RN & SPM: A road may be constructed. A few miles of motorized trail may become temporary or low standard road. Some available dispersed use areas could become dedicated to another use. Visible changes are nearly natural appearing (subordinate) as seen from roads, motorized trails & recreation use sites and areas. Sounds are consistent with setting in timing and type and are temporary or infrequent. There are rarely new smells. SPNM: Visible changes appear natural as seen from roads, trails & recreation use sites and areas. Disturbance/use apparent from dispersed views small in scale and subordinate to the natural appearing surroundings. Infrequent or rare new sounds or smells. P: No apparent change in these recreation settings.	A few recreationists are displaced from some dispersed use areas and motorized travel ways. On rare occasions, recreationists may be displaced or dissatisfied by non-recreation motorized use in SPNM areas.	All lands remain in the same ROS class.
High	Change would be great enough in any area, site specifically, for that setting to become less natural and more developed overall. The previous setting would be lost in the greater area, and some of the area may be closed to recreation use.	Past users of the affected area would be displaced or accept a different type of experience.	Site specific ROS Changes: RN->R, SPM->RN, SPNM->SPM, P->SPNM
Extreme	A highly modified appearing motorized development in a previously Primitive setting, accessed by a high standard road and occupied by several people year long.	A large number of recreationists displaced from the area. Users move to other areas of the Front or BMWC and social encounters increase there.	Site specific ROS Changes: RN->RM**, SPM->RM, SPNM->RM, P->RM

ROADLESS CHARACTERISTICS

Consequence	Natural Integrity	Apparent Naturalness	Remoteness	Solitude Opportunity	Unique Features	Manageability, Boundaries
Negligible	Minimal Activity, non-ground disturbing.	Activity not visible.	Short term and non-ground disturbing.	Activity minimal and in off-season.	No activity. (Uniqueness of large block of roadless.	No long term effects.
Low	Localized disturbance with natural vegetation rehab.	Localized non-linear disturbance with natural vegetation rehab.	Activities are adjacent to roaded areas and are small, localized in low rec. use.	Activities minimal and off season or require minimum of people.	Disturbance small, near edge of roadless and away from other unique features.	Disturbance is small and along edge near roaded area.
Moderate	Area of disturbance is adjacent to roaded and or within non-native vegetation, or disturbance in common vegetation.	Disturbance must appear subordinate to characteristic landscape from any common viewing place (trails, camps, roads).	Activities are localized; roads are temporary. Remoteness temporarily lost. Road and development area.	Activities and access localized, workers to not disperse from work and access areas.	Disturbance away from unique features other than large roadless block, which is site specifically, compromised.	Existing boundary is retained but may include small-disturbed area OR boundary is adjusted around disturbance near its edge.
High	Integrity is degraded by new large area of non-native vegetation including noxious weeds.	A disturbance contrasts strongly with surroundings and appears dominant from many places within & outside roadless.	Activities are so permanent that remoteness is lost (new roaded area).	Permanent new roads and use that displaces users seeking solitude to another area.	A unique feature, (species, habitat, geologic) is lost or large block of roadless is compromised.	The size of the roadless area shrinks to exclude interior area of disturbance and its access route.
Extreme	Biological & physical features are so altered that integrity is irretrievably lost in one or more drainages.	Disturbance covers a large area & appears dominant over landscape character even in views from Hwy 89 or 287, cannot rehab.	Activities permanent and lost remoteness leads to compromised remoteness in BMWC & other roadless by proximity.	Permanent roads & increased use is great enough to reduce solitude in BMWC & other roadless by displacing users.	A large block is removed from roadless, & unique species, habitats, geologic features are lost.	Boundary is fragmented by multiple roads leading into activities within the roadless area leaving boundaries difficult to identify.

WATER RESOURCES & FISHERIES

Consequence	Change in Stream Flow	Changes in Sedimentation	Changes in Water Quality	Fish and Aquatic Habitat
Negligible	No Change	No Change	No Change	No impact on aquatic life or habitat.
Low	Minor decrease or increase in flow.	Minor increase in Sediment, of short duration.	Minor change in water chemistry, localized and easily controllable contamination, no residual contaminants.	Minor impact on aquatic life or habitat, of short duration.
Moderate	Some decrease or increase in flow.	Some increase in sediment, with longer duration.	No long lasting change in water chemistry, more extensive contamination or mitigation measures required.	Localized short-term reversible impact on aquatic life or habitat.
High	Significant decrease or increase in flow.	Significant increase in sediment, over a long period.	Significant changes in water chemistry, extensive contamination can be remedied with great effort and some long lasting mitigation is required.	Widespread, long-term impact on aquatic life or habitat.
Extreme	Creek runs dry or large deviation in flow or flood regimes	Major increase in sediment, over a long period.	Major, uncontrolled release of contaminants, which cannot be completely remedied and produces regional-scale effects.	Severe, potentially irreversible impact on aquatic life or habitat

APPENDIX F

BIOLOGICAL ASSESSMENT

for the

ROCKY MOUNTAIN FRONT MINERAL WITHDRAWAL

LEWIS & CLARK AND HELENA NATIONAL FORESTS

Prepared/Approved by /s/ David Whittekiend Date March 14, 2000
Wildlife Biologist

Updated to reflect the listing of Canada Lynx July 18, 2000

I. INTRODUCTION

This biological assessment analyzes the potential effects of the proposed Rocky Mountain Front Mineral Withdrawal on threatened, endangered and proposed species on the Lewis & Clark and Helena National Forests.

Lewis and Clark National Forest Plan Standard C-2 instructs the Forest to comply with the Endangered Species Act of 1973, as amended, which obligates the Forest Service to conduct activities and programs which assist in identification and recovery of threatened and endangered plant and wildlife species. The Helena National Forest Plan requires that an evaluation be done for all projects that may impact any Threatened or Endangered species or its habitat (II/19).

The purpose of this biological assessment is to make a determination regarding the likely effects of this action on the status of these species and determine whether formal consultation or conference with U.S. Fish and Wildlife Service (USFWS) is required. The project area contains suitable habitat for three listed and one proposed species known to occur on the Lewis & Clark and Helena National Forests. These species will be evaluated in this document.

Endangered:

Gray Wolf

Canis lupus irremotus

Threatened:

Grizzly Bear

Ursus arctos horribillis

Bald Eagle

Haliaeetus leucocephalus

Bull Trout

Salvelinus confluentus

Canada Lynx

Lynx canadensis

The USFWS published an updated Notice of Review of plant and animal taxa that are candidates for listing as threatened or endangered in the February 28, 1996, Federal Register (61 CFR 7596). Beginning with that notice, the Service will recognize as candidates only those plant and animal species for which the Service has sufficient information on biological status and potential threats to propose listing them as endangered or threatened under the Act. Formerly such species were considered Category 1 candidate species. The status of these species will be discussed in this evaluation.

Candidate:

Swift Fox

Vulpes velox

II. PROPOSED ACTION

Under the proposed mineral withdrawal, no new claims for federal hardrock minerals could be located within the withdrawal area for twenty years. The withdrawal would be subject to review at the end of the twenty-year period.

Exploration and mining for locatable minerals would be prohibited on federal lands without valid existing rights. The proposed mineral withdrawal would not apply to private lands.

The Helena and Lewis & Clark National Forest Land and Resource Management Plans would be amended to be consistent with the terms and conditions of a mineral withdrawal.

III. CONSULTATION TO DATE

The Lewis and Clark National Forest submitted a letter to USFWS on May 14, 1999 with a species list for the Rocky Mountain Ranger District. U.S. Fish and Wildlife Service concurred with the list of species in writing on May 26, 1999. In February 2000, USFWS sent another species list for the state of Montana and instructed us to check the February list against any previous lists that they had sent. In comparing the May list and the February list, the only difference is that the peregrine falcon has been removed from the list by the process of delisting. Therefore the peregrine falcon will not be evaluated in this BA, but will be handled as a sensitive species.

IV. AFFECTED ENVIRONMENT AND EFFECTS OF IMPLEMENTATION

GRAY WOLF

a. Existing Condition

There are no known established wolf packs within the study area. Several packs have attempted to establish along the Rocky Mountain Front in the past 10 years. The Sawtooth pack lasted longest. This pack was first identified in 1993 (Diamond and Finnegan 1994). The pack was removed by USFWS in 1996 after a series of livestock depredations. In 1999, a radio-collared female traveled across the continental divide from Spotted Bear to the Rocky Mountain Front. She joined with two uncollared males. These wolves were also removed after several livestock depredations. Three wolves have been reported in the Alice Creek area. It is unknown if they have formed a pack. Lone wolves are reported periodically and are presumed to be traveling through the area.

b. Effects

Under alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for future mineral activity, which was developed as one possible scenario for analysis purposes, assumes no mines would be developed and no other exploration would take place.

Direct, Indirect and Cumulative Effects: There would be no effects to gray wolves from mining activities under this alternative. Other activities ongoing or planned in the near future would continue and the effects of those activities would not change.

GRIZZLY BEAR

a. Existing Condition

Nearly all of the study area is classified as Management Situation One grizzly bear habitat. Several small areas are classified as Management Situation Three grizzly bear habitat. These are areas around campgrounds and other sites with heavy human development. Potential spring range and denning habitat has been mapped. Spring habitat areas are used from April 1 to June 30 on average. During the spring, most bears in the study area are below 2000 meters (6560 feet) in elevation. During this time they are searching for plant material and carrion to replace reserves used during the denning period. Habitat components most commonly used during spring include closed timber, aspen stands, riparian areas and open timber stands (Aune and Kasworm 1989). Denning habitat is used from approximately October 15 to April 15. Most den sites are located above 1900 meters (6232 feet) in elevation, on slopes greater than 30% (Aune and Kasworm 1989). Grizzly bears forage on a wide variety of food items. Ungulate prey species are particularly important during spring and fall in the study area (Aune and Kasworm 1989). The bears consume plant products, insects and mammals during the rest of the year.

b. Effects

Under alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for future mineral activity, which was developed as one possible scenario for analysis purposes, assumes no mines would be developed and no other exploration would take place.

Direct, Indirect and Cumulative Effects: There would be no effects to grizzly bears from mining activities under this alternative. Other activities ongoing or planned in the near future would continue and the effects of those activities would not change.

BALD EAGLE

a. Existing Condition

Bald eagles are not known to nest within the study area. They are often seen soaring the winter ranges for carrion. All known nest sites are associated with river corridors outside of the study area. No roosting sites have been documented in the study area. Bald eagles migrate along the Rocky Mountain Front during the spring and fall.

b. Effects

Under alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for future mineral activity, which was developed as one possible scenario for analysis purposes, assumes no mines would be developed and no other exploration would take place.

Direct, Indirect and Cumulative Effects: There would be no effects to bald eagles from mining activities under this alternative. Other activities ongoing or planned in the near future would continue and the effects of those activities would not change.

BULL TROUT

a. Existing Condition

Bull trout are present in the lower reaches of Alice Creek. Alice Creek is considered a "Special Emphasis" watershed, one of several in the Blackfoot River drainage. The "Special Emphasis" is to maintain a refugia network for the protection and recovery of bull trout. Surveys have not detected bull trout within the study area, but they may be present in low numbers. A 1993 survey found one large spawning bed and a 1999 survey found two smaller spawning beds in the lower reaches. It is likely that fluvial spawners migrating out of the Blackfoot River created these beds.

b. Effects

Under alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for future mineral activity, which was developed as one possible scenario for analysis purposes, assumes no mines would be developed and no other exploration would take place.

Direct, Indirect and Cumulative Effects: There would be no effects to bull trout from mining activities under this alternative. Other activities ongoing or planned in the near future would continue and the effects of those activities would not change.

LYNX

a. Existing Condition

Lynx habitat is present throughout the study area. Winter furbearer surveys on the Rocky Mountain Ranger District between 1990 and 1992 recorded 23 lynx tracks or sightings scattered across the district (Finnegan 1992). Lynx observations in the study area are in forested lands that accumulate deep snow during the winter.

b. Effects

Under alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for future mineral activity, which was developed as one possible scenario for analysis purposes, assumes no mines would be developed and no other exploration would take place.

Direct, Indirect and Cumulative Effects: There would be no effects to lynx from mining activities under this alternative. Other activities ongoing or planned in the near future would continue and the effects of those activities would not change.

SWIFT FOX

a. Existing Condition

This is a species whose habitat is the short-grass plains of eastern Montana. The swift fox was thought to be extinct in the State until 1978 when a specimen was collected in southeastern Montana. A recent compilation of reports since then provides over 40 confirmed and unconfirmed swift fox observations in the State, most of them in the period from 1992 to 1995 (Giddings and Knowles, 1996). None of the reports were near the project area. The closest location to the study area was a sighting in Glacier National Park at the Cutbank Ranger Station. The study area does not contain suitable habitat.

b. Effects

Under alternative B, approximately 405,000 acres of federal land would be closed to mineral entry. No unpatented claims exist within the withdrawal area. The forecast for future mineral activity, which was developed as one possible scenario for analysis purposes, assumes no mines would be developed and no other exploration would take place.

Direct, Indirect and Cumulative Effects: There will be no direct, indirect or cumulative effects to swift fox because there is no suitable habitat within the project area.

V. DETERMINATION OF EFFECTS

Implementation of the proposed Rocky Mountain Front Mineral Withdrawal will have **no effect** on gray wolf, grizzly bear, bald eagle, bull trout, lynx and swift fox.

VI. CONSULTATION, COORDINATION

A. USFWS

Anne Vandehey
U.S. Fish and Wildlife Service
100 North Park, Suite 320
Helena, MT 59601

VII. LITERATURE CITED

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APPENDIX G

EXISTING WITHDRAWAL AREAS AND INHOLDINGS

There are 8,312 acres in the Gibson Reclamation Withdrawal Area (which includes the 40 acre parcel that was recently revoked in the proposed Bliss Exchange).

In addition to Gibson, the following sites are withdrawn from Mineral Entry on Rocky Mountain Ranger District:

	<u>Acres</u>	<u>Area #</u>
-Benchmark Recreation Area	630.0	M070206
-Elk Creek Ranger Station	107.6	M41837
-Ear Mtn. Admin Site	80.0	M41839
-Ear Mtn. Admin Site	149.87	M41840
-Blackleaf R.S.	176.96	M41847
-N. Dupuyer R.S.	345.0	M41847
-Willow Creek R.S.	245.0	M41850
-Beaver Cr R.S.	17.2	M45189
-Palmer's Flat R.S.	77.8	M45190
-Wood Lake CG	80.0	M20539

The following site is withdrawn from Mineral Entry on Lincoln Ranger District: 40 acres on Silver King Mountain for a repeater site.

1996 Status Records show 5,001.16 acres of private inholdings on Rocky Mountain Ranger District. There are no known changes to land status since then.

1997 Status Records show 155.5 acres of private inholdings on the Lincoln Ranger District. There are no known changes to land status since then.



APPENDIX H

WATER RESOURCE OBJECTIVES AND REGULATIONS

Forest Plan standards and guides incorporate applicable agency direction, state and federal regulations, and Cooperative Agreement with the State of Montana.

Forest Service Manual objectives relating to water are to:

1. Reduce risk of flooding;
2. Minimize impacts of flood on human safety, health, and welfare;
3. Minimize destruction, loss and degradation of wetlands; and
4. Preserve and restore the natural and beneficial values of floodplains and wetland.

The following is a list of major legislation that affects water:

- National Forest Management Act of 1976 - Provides for protection of watershed condition and protection of water conditions and/or fish habitat.
- Organic Administration Act of 1897 - Withdrew lands from the public domain for securing favorable conditions of water flows.
- Federal Water Pollution Control Act of 1972, as Amended By The Clean Water Act Of 1977 (Commonly Referred to as Clean Water Act) - The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters.
- Executive Order 12088 - Federal compliance with pollution control standards.
- Antidegradation (40 CFR 131.12) - Water quality necessary to protect existing uses must be maintained. Maintain current water quality when it exceeds a level necessary to support beneficial uses, and protect and maintain highest water quality for outstanding National resource waters.
- State Water Quality Standards (ARM 16.20.6,) - Adopts standards to conserve water by protecting, maintaining, and improving the quality and potability of water for public water supplies, wildlife, fish and aquatic life, and other beneficial uses.

The Forests manage watersheds to protect fisheries habitat, water-based recreation opportunities, municipal water supplies, and to meet or exceed State and Federal water quality standards. The State Water Quality agency and the Forest Service have developed soil and water conservation practices cooperatively. Land managers are directed to incorporate these practices into management activities. One of the objectives of water quality survey and monitoring is to improve the quality of water in degraded watersheds with restoration projects on a priority basis. Responsible officials are further directed to monitor on-going projects in order to identify and correct or terminate projects causing unacceptable impacts to the water resource.

Before scheduling or approving projects that involve significant removal of vegetation, involve flood plains, wetlands, riparian areas, or other bodies of water, or that could affect hydro-meteorological data collection sites, analysis is completed to display potential effects and to identify mitigation measures. Riparian zones receive special consideration in road design, location, and construction, and in general, concentrated use in the zones is discouraged.

Water quality concerns are mainly associated with surface and underground water contamination, damage to riparian areas, and protection of municipal watersheds.

Section 305(b) of the Clean Water Act requires each state to submit a biennial report on surface and ground water quality. Probable impaired uses, probable cause of impairment and probable source of impairment are listed along with degree of use support or magnitude of impairment.

APPENDIX I

COMMODITY MARKETS

The mineral potential analysis identified two deposit types that are consistent with the geologic setting of the area proposed for mineral withdrawal. Commodities associated with those two deposit types include lead, zinc, copper, and silver. An important component of the activity forecast is to evaluate whether there is adequate financial incentive for companies to explore and develop probable deposits. Following are summaries of the markets for lead, zinc, copper, and silver, and a discussion of general trends in spending for exploration and development.

Lead

The worldwide production of refined lead totaled 6.0 million metric tons in 1998, essentially the same as in 1997. Lead output from mines was 3.1 million metric tons, so recycled lead accounts for about 50 percent of world supply. The U.S. mine production of lead was 449,000 metric tons in 1998, which was less than 1997, but still about 21 percent above the 1994 level. Much of the production increase in recent years is attributable to expansion of the Red Dog mine in Alaska. Mines in Alaska and Missouri accounted for 92 percent of U.S. production in 1998 (U.S. Geological Survey, *Mineral Industry Surveys-Lead*, 1999).

Secondary refinery production in the U.S. totaled 1.1 million metric tons in 1998, while imports of lead in all forms were 356,000 metric tons. Lead exports, excluding scrap, were 176,000 metric tons. Lead supply in the U.S. was augmented by the disposal of 54,000 metric tons from the National Defense Stockpile. About two-thirds of the U.S. supply of lead originates from recycled products, principally spent batteries.

The total world consumption of refined lead was 6.0 million metric tons in 1998, which was slightly below the 1997 figure. Consumption fell by 100,000 metric tons in Asia due to the economic problems there, but increases in several other regions, including North America, partially offset the loss. Over the last five years, an average of 71 percent of global lead consumption has been for batteries (International Lead and Zinc Study Group, 1999).

In the U.S., where 1998 consumption was an estimated 1.6 million metric tons, batteries have accounted for around 87 percent of consumption. The higher proportion in the U.S. is likely a result of greater battery use in industrial applications, such as for uninterruptible power systems (UPS) in hospitals, computers, and telecommunications. In contrast to growth in the battery market, health and environmental concerns have caused lead consumption in ammunition, bearing metals, and solder to trend downward over the last few years.

With world refined lead production and consumption roughly in balance in 1997 and 1998, there was little change in the lead price. The 1998 North American producer price was quite stable throughout 1998, averaging 45.3¢ per pound.

The International Lead and Zinc Study Group (1999) forecasts that refined lead production will increase by 3.3 percent in 1999 to 6.16 million metric tons. Lead demand is projected to rise only to 6.12 million metric tons, however, and along with releases from the U.S. National Defense Stockpile and higher exports from China, the excess of Western World supply over demand is anticipated to be about 130,000 metric tons. This should have a dampening effect on lead prices in 1999.

In constant 1998 dollars¹, annual average lead prices over the long term should fluctuate between 35¢ and 50¢ per pound, the range experienced over the 1991-1998 period. Lead and zinc often occur in the same

¹ Prices expressed in real or constant dollar terms means that adjustments have been made to remove the effects of inflation. No such adjustments have been made, however, for prices expressed in nominal or current dollars.

deposit, and market conditions for the two commodities are expected to be marginally favorable toward generating interest in exploring for and developing such deposits.

Zinc

World refined zinc production totaled 8.0 million metric tons in 1998, up from 7.8 million metric tons in 1997 (International Lead and Zinc Study Group, 1999). Over the last few years, the largest increase in refined production has occurred in Asia, with other regions stable or slightly increasing. Mine production of zinc rose from 5.5 million metric tons in 1997 to 5.6 million metric tons in 1998. Zinc output from U.S. mines increased by 15 percent in 1998 to 698,000 metric tons (U.S. Geological Survey, *Mineral Industry Surveys-Zinc*, 1999). U.S. production, therefore, represented about 12 percent of the world total. With significant production from its Red Dog mine, Alaska accounts for more than 50 percent of U.S. zinc output.

Worldwide consumption of refined zinc was 7.9 million metric tons 1998, which was about 100,000 metric tons higher than in 1997. Zinc consumption increased in most regions, although, as with lead, economic problems in Asia caused zinc consumption to fall there. In the U.S., the apparent consumption of zinc was 1.3 million metric tons, a slight increase from a year earlier.

Over the last 5 years, galvanizing applications have accounted for an average of 47 percent of worldwide zinc consumption. About 55 percent of U.S. zinc consumption was for corrosion-protection purposes in 1998. While the growth in zinc consumption in the U.S. automotive market has been strong, the demand for zinc in the building sector has been expanding at an even faster rate.

With global refined zinc production exceeding consumption by about 100,000 metric tons, zinc prices softened considerably in 1998. The North American producer price averaged 51.4¢ per pound compared to 64.6¢ per pound in 1997. In constant dollar terms, the zinc price was the lowest since 1993. During 1998, prices fluctuated between 47.9¢-52.7¢ per pound, with lower prices prevailing toward the end of the year. Prices firmed somewhat beginning February 1999 and have stayed above 50¢ per pound since then.

For 1999, the International Lead and Zinc Study Group projects that demand for refined zinc will rise by 2.2 percent, while the output of refined zinc is expected to increase 2.1 percent. Thus, supply and demand should be roughly in balance, leading to stable prices. Over the long term, annual average zinc prices should remain within the range experienced between 1991 and 1998 (i.e., 51¢-66¢ per pound, in constant 1998 dollars). As discussed above in the *Lead* section, marginally favorable market conditions for lead and zinc could result in some interest in exploring for lead-zinc deposits.

Copper

World refined production of copper reached 14.0 million metric tons in 1998, up about 500,000 tons from 1997 (International Copper Study Group, 1999). Output from mines totaled 11.9 million metric tons compared to 11.4 million metric tons a year earlier. Mine production of copper in the U.S. increased from the mid-1980s through the mid-1990s, but has since leveled off. In 1998, U.S. mines produced 1.86 million metric tons of copper, which was slightly below the 1996 and 1997 figures (U.S. Geological Survey, *Mineral Industry Surveys-Copper*, 1999).

Africa's share of world output has declined since about 1990, primarily due to falling production in the Congo (formerly Zaire) and Zambia. High stripping ratios have led to escalating costs in those two countries. South America, on the other hand, has seen its proportion of world mining output rise over the years with both Chile and Peru contributing. Other regions have not exhibited much change in their shares.

In the U.S., imports of refined copper totaled 683,000 metric tons in 1998, more than double the levels of the early 1990s. Exports fell to 86,000 metric tons.

Low copper prices have resulted in a number of shutdowns of North American copper facilities. Broken Hill Proprietary Ltd. (BHP) announced in June of this year that it was closing its North American operations at the end of August. BHP operates the San Manuel Mine in Arizona and the Robinson Mine in Nevada, which have a combined annual capacity of 150,000 metric tons. Also affected by the BHP closures were the smelter, refinery, and wire-rod mill at San Manuel.

Phelps Dodge Corp. announced that it was closing one of the concentrators at Morenci, Arizona, as well as its Hidalgo smelter in New Mexico. Phelps Dodge also shut down the Ojos del Salado Mine in Chile and the Cobre Mine in New Mexico, and output from the Chino Mine (New Mexico) has been reduced (Ortega, 1999). In British Columbia, the Highland Valley Copper Mine, which is owned by Cominco Ltd. and Rio Algom Ltd., closed in May 1999 (Whitman, 1999).

World consumption of refined copper rose to 13.5 million metric tons in 1998 from 13.1 million metric tons in 1997. Economic problems in a number of Asian countries caused consumption in that region to fall in 1998, thus having a dampening effect on the growth in global demand. Since the increase in refined copper consumption was not enough to match the expansion in production, the refined copper surplus (total refined production • total refined consumption) exceeded 0.5 million metric tons.

In the U.S., the apparent consumption of copper increased by 60,000 metric tons to reach 3.0 million metric tons in 1998. This represents a slowing of the expansion experienced over the 1995-1997 period. Detailed 1998 consumption data by end-use category are not yet available, but the continuing strong performance of the U.S. economy likely kept copper demand in major industrial sectors at or slightly above 1997 levels. Housing starts totaled 1.6 million units in 1998 compared to 1.5 million units in 1996 and 1997 (Federal Reserve Board, 1999). The value of new construction of all types rose to \$654.5 billion in 1998 from the 1997 figure of \$618.1 billion. An increase in domestic truck production more than made up for a drop in the constant dollar value of domestic auto output from 1997 to 1998.

With production, levels outpacing worldwide copper demand in 1997 and 1998, copper stocks ballooned and prices fell precipitously. On the London Metal Exchange (LME), the copper price averaged \$.75 per pound in 1998, which, in constant dollar terms, was the lowest annual average price recorded in data going back 150 years. During 1998, the price peaked at \$.82 per pound in April, hovered in the \$.73 - \$.76 range from June to September, and then dropped through the remainder of 1998 and on into 1999. The price bottomed out at \$.63 per pound in March 1999 and has since firmed to over \$.80 per pound. Factors supporting copper prices in recent months include the closing of a number of mines and evidence showing that the economies of various Asian countries are on the rebound. Nevertheless, at the end of June 1999 refined copper stocks remained very high at 1.5 million metric tons.

When the International Copper Study Group (ICSG) released its December 1998 *Directory of Copper Mines and Plants*, it projected that world mine capacity would grow at a rate of about 2 percent per year from 1998-2002 (E&MJ, February 1999). This forecast was based upon existing mines and projects already under development and did not include potential capacity from projects in the exploration or feasibility stage. Projects in the exploration or feasibility stage could boost mine capacity by another 590,000 metric tons of copper by 2002. World smelter and refined capacity are forecast to increase by 2.4 percent and 2.9 percent per year, respectively, between 1998 and 2002. These projections were made before this summer's round of shutdowns, so the forecast growth rates could be overstated, particularly for mine capacity.

On the demand side, worldwide copper consumption should grow at a healthy rate. One prediction is that global consumption may rise by 5 percent per year (Hollands, 1997). Copper consumption in China rose by almost 50 percent from 1992 • 1997, and the International Trade Administration (ITA) forecasts that Chinese copper consumption will continue to expand at similar rate for the foreseeable future (ITA, 1999). The Japanese economy appears to be recovering (Landers, 1999), which should provide a significant stimulus to copper demand. In the U.S., copper consumption is expected to increase by about 2 percent per year from 1998 • 2003 (ITA, 1999).

Continued strong demand along with cutbacks in production should cause the copper market to move toward a more balanced state. Refined stocks should decline, providing support for an upward movement in prices.

Recent settlement prices in the copper futures market indicate that copper prices are expected to advance at a rate slightly in excess of inflation over the next couple of years. Over the longer term, copper prices should rise even higher as supply and demand become more balanced.

With the exception of 1995 and 1998, years when the copper market seemed to be far out of equilibrium, copper prices experienced since 1991 are regarded as representative of what might be expected for the foreseeable future. As described above, 1998 was characterized by a huge buildup of refined stocks, which caused copper prices to plummet to levels not seen for 150 years. On the other hand, transitory factors, including problems at the Kennecott smelter in the U.S. and a strike at the Chuquicamata mine in Chile, helped boost copper prices to abnormally high levels in 1995.

Ignoring the 1995 and 1998 prices as being a result of highly unusual market conditions, copper prices over the long term should range from \$.95-\$1.23 per pound (constant 1998 dollars). With prices currently below the low end of the range, there is little financial incentive to explore for copper. Even when surplus stocks are reduced and prices once again reflect a balance between supply and demand, companies may choose to look at reopening mothballed properties before searching for new deposits. Thus, during the forecast period there is a low probability that copper will be a prime target of company exploration efforts.

Silver

Approximately 16,200 metric tons of silver were produced from the world's mines in 1998, down 200 metric tons from 1997 (U.S. Geological Survey, *Mineral Industry Surveys-Precious Metals*, 1999). With output of 2040 metric tons in 1998, the U.S. ranked third behind Mexico and Peru in mine production. U.S. silver production declined from the 1997 figure of 2150 metric tons, as low gold prices caused the amount of silver produced as a byproduct from Nevada gold mines to fall. Primary silver mines accounted for slightly over 50 percent of mine output. The Greens Creek mine in Alaska was the largest silver producer in the U.S. in 1998 and the third largest in the world.

In 1998, 3600 metric tons of refined silver were produced in the U.S., with 1700 metric tons of the total originating from secondary sources. U.S. imports of silver totaled 3330 metric tons in 1998, while exports fell to 2500 metric tons. The Defense Logistics Agency also released 250 metric tons of silver from the government stockpile in 1998.

Global demand for silver was 26,855 metric tons in 1997, up from 25,698 metric tons in 1996 (The Silver Institute, 1998). Preliminary figures show another increase for 1998. Industrial demand for silver has been strong over the last few years, particularly in electronics. Silver is used in capacitors, contacts, and resistors in mobile phones, pagers, and other electronic devices. The growing popularity of photography in India and China has helped maintain the upward trend in silver consumption in that use. Strong demand for silver in the fabrication of jewelry and silverware in Italy and India has more than offset decreases in other countries, such as Japan and Thailand. Much of the jewelry and silverware fabricated in Italy is exported, while jewelry and silverware made in India tends to be purchased by residents of India. Silver consumed in the fabrication of coins and medals rebounded in 1997 after shrinking for two years in a row.

The silver price averaged \$5.54 per troy ounce in 1998, an increase of 13.3 percent over the 1997 figure of \$4.89 per troy ounce. In constant dollars, the 1998 silver price was the highest since 1994. The silver price peaked at \$6.74 per troy ounce in February before trailing off toward the year's low of \$4.88 per troy ounce in December. The price spike in the early part of the year has been attributed to an announcement by Warren Buffett that his company, Berkshire Hathaway Inc., had purchased 130 million troy ounces (4043 metric tons) of silver. The rally was short-lived, however, and many speculative investors subsequently liquidated their positions.

The supply shortfall that has existed for a number of years is expected to continue, albeit at lower levels. Modest increases in silver consumption are expected, and silver production capacity from new mines is projected to be added at a rate of 3 percent per year for the next several years. Since about three-fourths of silver is mined as a byproduct, silver production will be dependent upon what happens to the markets for the

primary commodities. For example, the closing of copper and gold mines due to poor market conditions will offset at least some of the new silver production capacity.

Recent futures market transactions show that silver prices are projected to rise slowly over the next 6-8 months before beginning to decline. Over the long term, annual average prices should remain within the range experienced over the 1993-1998 period, that is, \$4.72-\$5.67 per troy ounce (constant 1998 dollars). For the foreseeable future, there is likely to be some interest in exploring for deposits where silver is the primary commodity. Deposits requiring a large revenue contribution from, say, copper to be economic will, however, tend to be ignored.

Exploration Spending and Mine/Mill Investment

Low prices for some metals have resulted in a significant drop in planned exploration expenditures and fewer projects at the development phase. Exploration spending for all commodities was projected to decrease 31 percent in 1998 (Engineering and Mining Journal, January 1999). Gold exploration expenditures fell 9 percent in 1997 and were expected to decline another 28 percent in 1998. The U.S. share of global exploration funding was 8.6 percent in 1998, down from 9.1 percent a year earlier.

According to the Engineering and Mining Journal's 1999 project survey, the number of mining or mill projects in the development stage fell to 116 from 140 in 1998. This survey was conducted before several companies announced further cutbacks, so it is likely even fewer projects remain in the development category. Hardest hit were gold and major base metal projects, with decreases ranging from 13.5 percent for copper mine/mill investment to 40 percent for gold project funding. North America accounted for 37 of the 116 projects.

APPENDIX J

PUBLIC COMMENT ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT AND AGENCY RESPONSE

OUTSIDE THE SCOPE

Comment:

- 8** I urge you to recommend wilderness classification for the whole Rocky Mountain Front.
- 130** This area really ought to be wilderness.
- 147** As this is an outstanding natural area of certain national significance and should be designated as Wilderness at this time.
- 220** Please make every effort to include these areas in the Wilderness Preservation System.
- 266** From the extensive information provided in the DEIS, the only advantage to withdrawing mining rights in this area is to allow it to be declared a wilderness area. ...by closing this area to mining, you are also setting into motion the process of making it off limits to the vast majority of Americans.
- 358** I would also urge the Forest Service to work with the public and the Congress to find permanent protection for this special area of Montana. Much of this area qualifies for official "Wilderness" designation...

Agency Response:

Decisions concerning future wilderness designation are beyond the scope of this analysis. Establishment of wilderness requires congressional legislation.

Comment:

- 177** I support IMMEDIATE enactment of a PERMANENT mineral withdrawal for the ENTIRE Rocky Mountain Front...
- 357** Please withdraw the Lewis and Clark from the threat of mining permanently, if possible.
- 377** ...I suggest making the decision effective for all time and not just 20 years, if that is possible under legal and Agency authority.
- 408** We recommend that the withdrawal be permanent, not merely for twenty years, if possible.

Agency Response:

By statute (Section 204 of the Federal Land Policy and Management Act [FLPMA]), withdrawals affecting more than 5,000 acres are limited to 20 years. At the end of the withdrawal period, the secretary may extend the withdrawal if it is determined that the purpose for which the withdrawal was first made requires the extension (Sec 204(f) FLPMA). This extension would be limited to an additional 20 years.

Comment:

382 This area should be part of Glacier National Park, and as such should be protected.

Agency Response:

Decisions concerning national park designation are beyond the scope of this analysis. Establishment of national parks requires congressional legislation.

Comment:

248 ...I would strongly prefer to see the Rocky Mountain Front permanently and completely withdrawn from all development, including mineral leasing;...

Agency Response:

A withdrawal from mineral leasing was not considered in the proposed action. Because the effects to resources from mineral leasing are adequately addressed under existing authority (The Organic Act of 1897, the Mineral Leasing Act of 1920, and the Federal Onshore Oil and Gas Leasing Reform Act of 1987) a withdrawal from mineral leasing does not meet the purpose and need.

MINERALS

Comment:

43 There are sufficient management guidelines and laws to protect the land without withdrawing minerals.

12 This proposal assumes that CFR 228(a) regulations are not adequate to mitigate the effects of mining should occur. Otherwise there is no justification for this action (?).

- 426 The Forest Service has enough good safeguards in place to make sure it [mining] is done right.

Agency Response:

A decision on a mineral withdrawal is not necessarily a statement about the adequacy of existing laws and regulations. Rather it is a policy issue concerning the future land use in this area. Is mining an appropriate use of these federal lands given the other resource values present? The fact that projects may comply with existing laws and regulations is an important consideration, but not the only deciding factor for any withdrawal decision.

The study area has high values for many resources and is adjacent to Glacier National Park and three wilderness areas. The EIS describes the resources in this setting and considers how mining would affect these resources. The Secretary of the Interior must balance the value of resources in the area against the potential benefits and consequences of future mining, taking into account pertinent laws and regulations.

Comment:

- 12 This proposal seeks to bypass national policy, and the reasons for doing so are based on nothing but a dislike of mining. How can national policy apply to the rest of the nation, but not here?

Agency Response:

The mineral withdrawal, if approved by the Secretary of the Interior, is a change in policy and direction for management of these specific lands, rather than a violation or departure from Forest Plans and other laws and regulations.

The Forest Service Minerals Policy (8/3/95) established policies, goals and objectives applicable to the national as a whole, not to specific areas. While the proposed mineral withdrawal of the Rocky Mountain Front would not advance the mineral goals contained in the Forest Service Minerals Policy, it certainly does not preclude achieving the goals on a national scale.

Comment:

- 12 Those resource areas that gave a "moderate" rating did not take into account the various other environmental laws that would prevent or greatly constrain the likelihood of any environmental damage.

Agency Response:

The environmental effects analysis for each resource area is based on the mineral development forecast outlined in Table 2-2 and described in Appendix D. Anticipated effects from prospecting, exploration and drilling assume that these operations will comply with all federal surface management regulations (36 CFR 228, Subpart A) and other state and federal laws summarized in Appendix B. These laws serve to prevent environmental damage not reasonably incident to, or necessary for mining.

Comment:

- 12 The question that should be addressed is why the FS felt the need to take this action if the anticipated mining activity is so little and the effects of that activity are negligible.
- 30 The DEIS clearly demonstrates that the mineral resource of the area in question is minor and the likelihood of mineral development is very slight. Under such circumstances, I cannot understand the necessity for a mineral withdrawal.
- 266 ...there is less than a 1 in 10 chance of a claim being filed from this area, so it is obvious that there is no environmental damage being done with the current policy.

Agency Response:

The resource protection goal established by the Chief of the Forest Service for the Rocky Mountain Front is not just to reduce risks to resource values to extremely low levels, but to eliminate any risk from mining activities. The only way to achieve a "no risk" goal is withdraw the area.

- 465 Since Alldredge abandoned his claims in September 1999, and since those 2,000 acres also now are included in the withdrawal proposal, the acreage amount should be adjusted.

Agency Response:

The original acreage estimate of 429,000 acres was the overall area of the mineral withdrawal. It included lands already withdrawn, private lands and outstanding mining claims. This figure has been revised in the final EIS. The gross area is 420,000 acres. The area actually being withdrawn totals 405,000 acres.

PLANNING

Comment:

- 46 It should be noted that this proposal is consistent with the *Fish and Wildlife Plan – The Bob Marshall Wilderness Complex; Limits of Acceptable Change in Wilderness 1991*.

Agency Response:

Montana Fish, Wildlife and Parks developed this document, in cooperation with the Forest Service, as a plan for managing wildlife and recreation within the Bob Marshall Wilderness Complex and the lands surrounding it. It was never formally adopted by the Forest Service, but it lead to the creation of the Fish, Wildlife and Habitat Management Framework for the Bob Marshall Wilderness Complex signed by the Forest Service and Montana Fish, Wildlife and Parks. This document applies to management of the wildlife and fish resources found within the wilderness, which is already withdrawn from mineral entry.

Comment:

- 12 How did the FS happen to pick this as a priority? A mineral withdrawal of this magnitude was not mentioned in the Forest Plan. At the time it was apparently not an issue. What has changed and why is it now?

Agency Response:

At the time the Forest Plans were completed for the Helena and Lewis & Clark National Forests, mineral development along the Rocky Mountain Front was not envisioned. The area was considered to have very little probability for mineral development. In 1996, 104 claims were staked in the Muddy Creek area. The staking of these claims resulted in the evaluation of the appropriateness of allowing mining-related activities along the Rocky Mountain Front, given the extraordinary resources that could be impacted by these activities.

Comment:

- 12 ...if the FS decides this to be the case for the Rocky Mountain Front, it is reasonably foreseeable that other agencies or entities that want to stop mineral development will hold up this document as proof that the FS itself has no faith in its regulations and/or, that minerals are not a resource worth fostering or encouraging. This action sets a dangerous precedent, and yes, it is within the scope of this document, and it should be addressed.

Agency Response:

A mineral withdrawal is a tool available to the Administration and land management agencies to withhold lands from mining to

maintain other resource values in the area. Withdrawals are discretionary actions within the authority of the Forest Service and other land management agencies. The Rocky Mountain Front Mineral Withdrawal, as well as other administrative withdrawals, is applied to a specific tract of federal land. A withdrawal of more than 5,000 acres requires Congressional review.

Any future mineral withdrawal proposals must comply with withdrawal regulations at 43 CFR 2310, including environmental analysis required by the National Environmental Policy Act (NEPA). NEPA provides for public participation in this process.

Mineral withdrawals, as well as revocations, are not unprecedented. Withdrawals for several federal land management agencies for the period of 1994-1999 are summarized in Table J-1

TABLE J-1 ACRES OF WITHDRAWALS AND REVOCATIONS FROM 1995-1999 FOR FEDERAL LAND MANAGEMENT AGENCIES

AGENCY	WITHDRAWAL (acres)		REVOCATION (acres)	
	5 yr Total	Annual Avg.	5 yr Total	Annual Avg.
Bureau of Land Management	315,993	63,199	959,740	191,948
U.S. Forest Service	61,920	12,384	5,006	1,001
U.S. Fish and Wildlife Service	3,008	602	0	0
Totals	380,921	76,184	964,746	192,949

Note: The above figures are compilations of withdrawals and revocations that were administratively made by the Secretary of the Interior. Source: Public Land Statistics, USDI, BLM 1995-1999.

Comment:

- 12** How is it that the Lewis and Clark NF can give special use permits for numerous other activities on the Rocky Mountain Front, but feels that mining at any level, is inappropriate? Have the effects of mining been compared against other uses?

Agency Response:

Special use permits are analyzed on case-by-case basis. The Forest Service has the authority to approve or disapprove them. The Forest Service does not have the authority to regulate the staking of mining claims. The agency can regulate surface use, but cannot prohibit activities that are deemed necessary for the development of the claim. Activities that take place on National Forest lands are not compared against one another for approval.

ROADLESS

Comment:

- 44** Please note that alternative A suggests that continued mineral development will have a "negligible to low" impact on roadless areas. This is a gross understatement. Natural integrity and remoteness will be irreparably damaged without the immediate withdrawal of mineral activity.

Agency Response:

In Chapter 3, the "Effects of Alternative A" discusses the effects to roadless of not withdrawing the area from mineral entry for the next 20 years. Mining-related effects that are discussed are those expected from *prospecting* and *exploration*. Table E-5 shows a range of effects, from negligible to extreme to each of six roadless

characteristics. Descriptions of *prospecting* and *exploration* activities (see Appendix C, Table 3-1), compounded with motorized restrictions in much of the area, indicate that the consequences would likely be those described in the table as negligible or low. While mineral production activities would have consequences that could be high or even extreme, these types of activities were not discussed because of the low probability of occurrence (0.1% or one production activity in 1400 years).

ECONOMICS

Comment:

- 12 Is this not a waste of money and time? Please address this in the socioeconomic section.

Agency Response:

The proposal for withdrawing the Rocky Mountain Front is an activity that the Forest Service is pursuing to protect the unique resources along the Rocky Mountain Front. The purpose and need section under Chapter One of the EIS details the reasons for pursuing the withdrawal. The socioeconomic section of the EIS details the economic impacts of the both of the alternatives to the local communities. The money and time spent on the analysis of the proposed mineral withdrawal would not have a noticeable impact on the local economies.

WILDLIFE

Comment:

- 95 I might add that the chapter 3 section, Wildlife and Sensitive Plants, incorrectly states that the Lynx is only "Proposed" for listing under the ESA. I believe that as of March 21, 2000 the USFWS officially listed the Canadian Lynx as "Threatened".

Agency Response:

That is correct. The lynx was listed while the Draft EIS was being printed. The lynx status has been updated in the Final EIS.

Comment:

- 196 Nowhere does the DEIS mention any potential for cumulative impacts due to increased road densities, helicopters, vehicle traffic, etc. Nor does it account for the possibility of any new road construction dividing the large carnivores' habitat. The DEIS is stronger in its analysis of the adverse effects that road construction may have on small carnivores...and their

prey... but still lacks that analysis for cumulative impact potential as noted above.

Agency Response:

A discussion of the potential impacts of increased road densities, helicopters and vehicle traffic on large carnivores is found on page 43, Effects of Alternative A, of the draft EIS. The discussion for small carnivores is found on page 44, Effects of Alternative A. The effects analysis is based on the forecast for future mineral activity.

WATERSHED

Comment:

196 ...the DEIS does not adequately consider possible effects to water resources, water quality, and aquatic habitats due to possible soil disturbance and increased sedimentation.

Agency Response:

Please refer to Chp 1, page 2 for a discussion on the scope and nature of this analysis. Because this analysis focuses on a policy level decision, the effects are not site-specific and therefore, generally not quantifiable or detailed. The potential effects described in the analysis are based on the type and level of activity expected in the mineral activity forecast (Appendix C) and summary of assumptions (Appendix D). The consequences of these activities on the water resource are described in Chp 3, pages 90 and 91 and summarized in Appendix E, page E-6.

Comment:

196 ...the greatest concern lies in the fact that wetlands habitats were hardly mentioned. Protection of wetlands and floodplains (wildlife habitat and otherwise) is extremely under-represented. Even though they are a vital (and rapidly disappearing) habitat, and they "are found throughout the study area," they were not mapped for the study area, and they were not analyzed for potential impact under either alternative.

Agency Response:

The proposed action is a policy decision about future land uses in a 420,000 acre area (Chapter 1, p. 2). Protection of wetlands and floodplains is an issue more appropriate for analysis when considering a site specific proposal. Executive Orders 11990 and 11988 require all Federal agencies to avoid impacts to wetlands and floodplains unless there are no other alternatives.

GLOSSARY

Affected Environment - The biological, social, economic, and physical environment that will or may be changed by proposed actions.

Alluvial deposits - Unconsolidated rock materials, including clay, silt, sand, and gravel, deposited by flowing water.

Aquatic - Related to the water and wetted environment associated with flowing and standing surface waters (lakes, streams, rivers, and reservoirs).

Aquatic Ecosystem - A stream channel, lake or estuary bed, the water itself, and the biotic communities that occur therein.

Aquifer - A formation or group of geologic formations that contains sufficient saturated permeable material to yield water to wells or springs. An aquifer is either confined or unconfined.

Background - Distance between a viewer and what is being viewed is 3 to 5 miles to the horizon line. At this distance tree stands appear uniform and texture cannot be discerned.

Best Management Practices (BMP) - A practice or a combination of practices, that is determined by a State (or designated area-wide planning agency) to be the most effective, practical means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals (40 CFR 130.2g).

Big Game - Those species of large mammals normally managed as a sport hunting resource.

Biological Assessment (BA) - A stand alone document which reviews all Forest Service planned, funded, executed or permitted programs and activities for possible effects on Federally listed threatened, endangered, proposed and candidate species as identified for the cumulative effects area in coordination with the USFWS. A Biological Assessment is used to satisfy consultation requirements with the USFWS for projects requiring an Environmental Impact Statement (Reference: Sec. 7, ESA; 50 CFR, 402.12, 1508.7, 1508.25, and 1508.27.). The Biological Assessment displays the Determination of Effects for the DEIS or FEIS preferred alternative. The Determination of Effects is limited to: (1.) No Effect; (2) Not likely to adversely affect; (3) * Likely to adversely affect; and (4) Beneficial effect. * = Considered a trigger for a significant action.

Biological Evaluation (BE) - Documentation on USFS sensitive species (animal and plant) contained within an EIS. Documentation includes a review of USFS sensitive species present, their habitat, and document that addresses and identifies the Determination of Effects on these species. The USFWS review of the biological evaluation is addressed through public scoping and conducted in conjunction with over all agency review of the DEIS. Reference FSM 2673.4 - Biological Evaluations for Sensitive Species. The Determination of Effects is limited to: (1.) No impact; (2) May impact individuals, but is not likely to cause a trend to federal listing or loss of viability; (3) *Likely to result in a trend to federal listing or loss of viability; and (4) Beneficial impact. * = Considered a trigger for a significant action.

Biological Opinion - An official report by the US Fish and Wildlife Service (USFWS) issued in response to a formal Forest Service request for consultation or conference. It states whether an action is likely to result in jeopardy to a species or adverse modification to its critical habitat.

Candidate species - These species are designated by the U.S. Fish and Wildlife Service as being candidates for listing as threatened and endangered under the Endangered Species Act.

Code of Federal Regulations (CFR) - Regulations developed at the Department level for the specific implementation of a Public Law. For example, 36 CFR 228 are the implementing regulations for the Federal Onshore Oil and Gas Leasing Reform Act of 1987 (FOOGLRA).

Colluvial deposits - Unconsolidated rock materials, of medium to moderately fine textures and angular rock fragments, deposited by down slope movement of saturated soils.

Community - A group of populations living and interacting over a given area.

Cooperating agencies - Federal and State agencies (other than the lead agencies) that have jurisdiction by law or have special expertise with respect to the proposed action.

Corridor - An area through which species can move from one place to another over time in response to changes in environment or as natural parts of their history.

Cover - Vegetation used by wildlife for protection from predators, or to ameliorate conditions of weather, or in which to reproduce.

Cultural Resources - The physical remains of human activity (artifacts, ruins, burial mounds, petroglyphs, lithic scatters, etc.) and conceptual content or context (as a setting for legendary, historic, or prehistoric events, as a sacred area of native peoples, etc.) of an area of prehistoric or historic occupation.

Cultural site - Location of structures, features (such as, but not limited to, archeological pits, hearth, and walls), and historic and/or prehistoric artifacts.

Cumulative Effect - The impact on the environment, which results from the incremental impact of the action when added to other actions. Cumulative impacts can also result from individually minor but collectively significant actions taking place over a period of time.

Degradation of water - A change in water quality that lowers the quality of high-quality waters for a parameter. Reductions in mean monthly streamflow in excess of 15 percent are also considered to be degradation. Changes in water quality that are considered not to be significant are established by the Montana Department of Environmental Quality.

Dispersed Recreation - The portion of outdoor recreation use that occurs outside of developed sites in the unroaded and roaded Forest environment, (i.e. hunting, backpacking and berry picking).

Displacement - As applied to wildlife, forced shifts in the patterns of wildlife use, either in location or timing of use.

Diversity - The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan.

Endangered Species Act - A federal act to provide protection and conservation for threatened or endangered species.

Erodibility - A rating of the relative susceptibility of exposed soil to erosion by water or wind.

Existing visual condition - The level or amount of modification from a naturally appearing landscape.

Existing visual character - A general description of a visual environment in terms of landform, rock formations, water forms, and vegetative patterns often described in terms of line, form, color, and texture relative to the surrounding landscape.

Fen - A peat wetland that is fed by ground water.

Floodplain - Level area near a stream or river, constructed by a river in its present climate and overflowed during moderate flow events, usually defined as a 100-year recurrence interval flood.

Forage - All browse and nonwoody plants available to livestock or wildlife for feed.

Foreground – Distance between a viewer and what is being viewed is 0.25 to 0.5 miles. At this distance individual boughs of trees form textures.

Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA) - The parent act that preceded Forest Planning. This act directed that the National Forest System begin systematic resource planning on the National Forest units.

Forest Plan standard - A criterion set by the Forest Service to meet resource goals; for example, a 30 percent old growth standard for certain management areas.

Game Species - Any species of wildlife or fish for which seasons and bag limits have been prescribed under State or Federal Laws, Codes and Regulations, and which are normally harvested by hunting, trapping, and fishing.

Geology - The study of the planet Earth. It is concerned with the origin of the planet, the material and morphology of the Earth, and its history and the processes that acted (and act).

Glacial till - Unstratified glacial material deposited directly by a glacier without reworking by meltwater and consisting of a mixture of clay, silt, sand, gravel, and boulders.

Grizzly Bear Management Situation - Habitat for the grizzly bear is divided into five Management Situation categories based on grizzly habitat value and population distribution. If changes in grizzly population and distribution occur, restratification of these categories may become necessary. Habitat suitability combined with consistent grizzly distribution trends would be the basis for restratification. Population and habitat conditions of each Management Situation are described (Greater Yellowstone Area Grizzly Bear Guidelines, 1979) below:

Management Situation 1 - The area contains grizzly populations centers (areas key to the survival of grizzlies where seasonal or yearlong grizzly activity, under natural, free-ranging conditions is common) and habitat components needed for the survival and recovery of the species or segment of its population. The probability is very great that major Federal activities or programs may affect (have direct or indirect relationships to the conservation and recovery of) the species.

Management Situation 2 - The area lacks distinct grizzly population centers; highly suitable habitat does not generally occur, although some grizzly habitat components exist and grizzlies may be present occasionally. By definition, management situation 2 areas are those considered unnecessary for species survival and recovery, although the status of such areas is subject to review and change according to demonstrated grizzly population and habitat needs. The effects of major Federal activities or programs on the conservation and recovery of the species are not generally predictable.

Management Situation 3 - Grizzly presence is possible but infrequent. Developments, such as campground, resorts, or other high human use associated facilities, and human presence result in conditions that make grizzly presence untenable for humans and/or grizzlies. There is a high probability that major Federal activities or programs may affect the species conservation and recovery.

Management Situation 4 - Grizzlies do not occur in the areas but habitat and human conditions make the areas potentially suitable for grizzly occupancy, and the area is needed for the survival and recovery of the species. The probability is very great that Federal activities and programs may affect the species conservation and recovery.

Management Situation 5 - Grizzlies do not occur or occur but rarely in the area. Habitat may be unsuitable, unavailable, or suitable and available but unoccupied. The area lacks survival and recovery values for the species or said values are unknown. Major Federal activities and programs probably will not affect species conservation and recovery.

Ground water - Subsurface water in a zone of saturation which is or can be brought to ground surface through springs, seeps, wells or direct discharge to surface flows.

Habitat - A place where a plant or animal naturally or normally lives and grows.

Historic - The period after Euroamerican influences entered the study area.

Historic district - A geographic area with a number of related significant historic properties.

Igneous - A rock or mineral that solidified from molten or partially molten material, such as magma.

Indirect Effects - Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Interdisciplinary Team (ID Team) - A group of individuals with different training assembled to solve a problem or perform a task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad to adequately solve the problem. Through interaction, participants bring different points of view to bear on the problem.

Intrusive - Igneous rock that is forced into pre-existing rocks while still in a liquid state (magma).

Issue - A point of discussion, debate, or dispute about environmental effects.

Lead agency - Agency having responsibility for preparing the EIS. The USDA Forest Service is the lead agency for the proposed Rocky Mountain Front Mineral Withdrawal EIS.

Load or loading - The total weight of a compound that a stream transports over a given time period. Loading is determined by multiplying flow by concentration.

Management area - Areas of National Forest System lands that have common management direction and which may not be contiguous in the forest.

Management Indicator Species - In the Forest Plan, a species of animal or plant whose presence is a fairly certain indication of a particular set of environmental conditions. Indicator species serve to show the effects of development actions on the environment.

Management Situation - See Grizzly Bear Management Situation.

Maximum modification - Human activity may dominate the characteristic landscape, but should appear as natural when viewed as background.

Mesozoic - Era of geologic time between Permian and Tertiary periods, characterized by the presence of dinosaurs, marine and flying reptiles and the appearance of mammals.

Metasedimentary - Rocks that are mainly argillites, quartzites, siltites and siliceous limestones of the Precambrian Age Belt Supergroup.

Mineral entry - The filing of a mining claim on federal land to obtain the right to mine any locatable minerals it may contain. Also the filing for a mill site on federal land for processing off-site locatable minerals.

Mineral exploration - The search for valuable minerals.

Mineral occurrence – A place where a useful mineral or material is present; this term has no resource or economic connotation. Source: USGS Open File Report 84-787, Guide to Survey Reports on Public Lands, Gus H. Goudarzi, 1984.

Mineral resource – A concentration of naturally occurring solid, liquid or gaseous material in or on the Earth's crust in such form and amount that economic extraction of a commodity from the concentration is currently or potentially feasible. Source: USGS Open File Report 84-787, Guide to Survey Reports on Public Lands, Gus H. Goudarzi, 1984.

Mineralization - The process by which a mineral or minerals are introduced into a rock.

Mining-related actions - Mining related actions would include: Prospecting, Exploration (access, drilling, geophysical exploration, trenching, pits, underground geophysical exploration, bulk sampling, Development (drilling, development shafts and adits, access, power, communications, mine and mill site preparation), Production (underground and surface methods, ore dressing, wastes, roads), and Reclamation. See USDA Forest Service General Technical Report INT-35 for a discussion of these actions.

Mitigation - Any method used to lessen the adverse effect of a proposed impact. Mitigation means avoiding actions or protecting resources where practical, but mitigation for significant historic and prehistoric sites can include data recovery through excavation, photography, archival research, re-analysis of existing collections, and oral interviews. Data recovery is intended to provide a record of the site and the information it contains even though the site would be subsequently destroyed or altered.

Modification - Human activity may dominate the characteristic landscape but must, at the same time, utilize naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed in middle ground or background.

Moraine - A mound, ridge, or other distinct accumulation of unsorted, unstratified glacial drift.

National Forest Management Act - A law passed in 1976 as amendments to the Forest and Rangeland Renewable Resources Planning Act that requires the preparation of Regional and Forest plans and preparation of regulations to guide that development.

National Forest System - Includes all National Forest System lands reserved or withdrawn from the public domain of the United States; all National Forest System lands acquired through purchase, exchange, donation, or other means; the national grasslands; and land utilization projects administered by the Forest Service under Title FCCCIII D of the Bankhead-Jones Farm Tenant Act of 1937.

National Register of Historic Places - A recorded list of significant cultural historic and prehistoric sites in the United States. The National Historic Preservation Act created the National Register of Historic Places (NRHP). Sites listed on the NRHP are entitled to specified levels of protection from any undertaking that may damage the site.

Neotropical migrant - Migratory birds that have their winter habitat in southern latitudes (tropics) and their summer or breeding habitat in northern latitudes.

Noxious weeds - A legislated classification of undesirable plants that are of local concern due to their potential impacts such as reduced agricultural production and potential to displace native vegetation. Noxious weeds are generally not native to the local area.

Nutrient - Total inorganic phosphorus and total inorganic nitrogen.

OHV - Off-highway vehicles (4x4 high clearance vehicles, snowmobiles, ATVs, motorcycles).

Old growth forest - Individual trees or stands of trees that are past full maturity and showing a high degree of decadence. Old growth forests are considered ecosystems that are distinguished by old trees and related structural attributes. They encompass the later stages of stand development that typically differ from earlier stages in characteristics such as tree age, tree size, number of large trees per acre and basal area. In addition, attributes such as decadence, dead trees, the number of canopy layers and canopy gaps are important but more difficult to define.

Paleozoic - The earliest Era of geologic time. Characterized by the appearance of marine invertebrates, primitive fishes, primitive land reptiles, and land plants. Ranged from 570 million years to 225 million years ago.

Partial Retention - Human activities may be evident, but most remain subordinate to the characteristic landscape.

Patented mining claim - A former unpatented claim to which the U.S. has issued a document conveying ownership and title of both surface and mineral estates to a private party.

Permeability - The property of porous rock, soil or sediment for transmitting water; a measure of the relative ease of fluid flow under unequal pressure.

Pleistocene - The geologic epoch characterized by the alternate appearance and recession of glaciation, the Ice Age.

Population - A group of individuals of any one kind of organism living and interacting over a given area.

Precambrian - The oldest and largest division of geologic time, representing all geologic time before the Paleozoic.

Prehistoric - Refers to the Native American past in the study area before Euroamerican influences entered the area.

Primitive areas - Primitive areas are typically at least 5,000 acres in size and located not closer than 3 miles from all roads or trails with motorized use. The setting is generally an unmodified natural environment with little evidence of humans. Designated wilderness is typically an excellent example of this ROS class.

Project Area - See Study Area

Reclamation - The restoration of surface conditions to prevent erosion and/or promote revegetation of the disturbed area.

Recreation opportunity spectrum (ROS) - A framework describing, stratifying, and defining classes of outdoor recreation environments, activities, and experience opportunities. The settings, activities, and opportunities for obtaining experiences are arranged along a continuum or spectrum divided into six classes: primitive, semi-primitive, roaded-natural appearing, rural and urban.

Recreation visitor days (RVDs) - A statistical reporting unit consisting of 12 visitor hours. A visitor hour is the presence of a person on an area of land and water for the purpose of engaging in one or more recreational activities during a period or periods of time totaling 60 minutes. The Forest Service has traditionally used the visitor day as its statistical measure of recreation use.

Rehabilitation (rehab) - A management objective to restore undesirable visual impacts to the greatest degree possible. Rehabilitation may be achieved through the alteration, concealment, or removal of obtrusive elements.

Reserves - For this EIS, the portion of an identified mineral resource base that meets specified minimum physical and chemical criteria related to current mining and production practices and that can be economically and legally extracted at the time of determination. Quantity is computed from dimensions revealed in rock outcrops, trenches, workings, or drill holes; quality or grade is computed from results of detailed sampling.

Retention - Human activities are not evident to the casual Forest visitor.

Revegetation - The successful establishment of a permanent, self-sustaining stand of vegetation.

Riparian areas - Areas with distinctive resource values and characteristics, having an aquatic ecosystem and adjacent upland areas. This includes floodplains, wetlands, and all areas within a horizontal distance of about 100 feet from the normal high-water line of a stream channel, or from the shoreline of a standing body of water.

Riparian vegetation - Plant species that grow adjacent to streams or other bodies of water, or that require additional moisture to survive and are located in areas with run-in moisture or perched water tables.

Roaded Natural - Roaded Natural areas are located within ½ mile of non-primitive roads and railroads, and have no minimum acreage requirements. The landscape setting may have modifications, which may range from unnoticeable, to subtle, to those that visually dominate the landscape. Opportunities for solitude are usually less than the other ROS classes, while opportunities for social interaction are greater. *Roaded Modified* is a subset of roaded natural that is used to indicate areas where management, such as timber harvest or mining, visually dominate the appearance of the landscape.

Roadless area attributes - Characteristics of a Roadless Area, similar to wilderness characteristics. The Forest Service has established six attributes that are considered in analyzing effects to Roadless Areas: natural integrity; apparent naturalness; remoteness; solitude; special features; and manageability and boundaries. Natural integrity is the extent to which long-term ecological processes are intact and operating. Apparent naturalness is a measure of importance of visitor's perceptions of human impacts to an area. Solitude is a personal, subjective value defined as isolation from the sights, sound and presence of others, and of the development of man. Remoteness is a perceived condition of being secluded, inaccessible, and out of the way. Special features are those unique geological, biological, ecological, cultural or scenic features that may be located in a Roadless Area. Manageability and Boundaries relates to the ability of the Forest Service to manage a Roadless Area to meet size criteria (generally greater than 5,000 acres) and the other five attributes.

Runoff - Water that flows over the soil surface from areas that are impervious, locally saturated, or areas where the rainfall rate exceeds the infiltration capacity of the soil.

Scenic Integrity - State of naturalness, or conversely, the state of disturbance created by human activities or alteration. Integrity is stated in degrees of deviation from the existing landscape character in a national forest.

Scenic Integrity Levels (SILs) – The frame of reference for measuring achievement of scenic integrity levels is the valued attributes of the “*existing*” landscape character “*being viewed*”. In Natural or Natural appearing character this is limited to natural or natural appearing vegetative patterns and features, water, rock and landforms. Direct human alterations may be included if they have become accepted over time as positive landscape character attributes (source: Forest Service Handbook #701). Scenic integrity levels are defined below:

Very High (Unaltered) - Landscapes where the valued landscape character “is” intact with only minute if any deviations. The existing landscape character and sense of place is expressed at the highest possible level.

High (Appears Unaltered) – Landscapes where the valued landscape character “appears” intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such a scale that they are not evident.

Moderate (Slightly Altered) – Landscapes where the valued landscape character “appears slightly altered”. Noticeable deviations must remain visually subordinate to the landscape character being viewed.

Low (Moderately Altered) – Landscapes where the valued landscape character “appears moderately altered”. Noticeable deviations begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles outside the landscape being viewed. They should not only appear as valued character outside the landscape being viewed but compatible or complimentary to the character within.

Very low (Heavily Altered) – Landscapes where the valued landscape character “appears heavily altered”. Deviations may strongly dominate the valued landscape character. They may not borrow from the valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles outside the landscape being viewed. However, deviations must be shaped and blended with the natural terrain (landforms) so elements such as unnatural edges, road, landings and structures do not dominate the composition.

Unacceptably Low - Landscapes where the valued landscape character being viewed appears extremely altered. Deviations are extremely dominant and borrow little if any form, line, color, texture, pattern or scale from the landscape character. Landscapes at this level of integrity need rehabilitation. This level should only be used to inventory existing integrity.

Scoping - The process of explaining the proposed action, identifying issues related to the proposed mineral withdrawal, and reasonable alternatives that are to be analyzed in depth in an Environmental Impact Statement.

Sedimentary - Rocks formed by the deposition and consolidation of sediment.

Sedimentation - The process of deposition of clay, sand, gravel and/or organic fragments that have been transported by water or wind.

Sediment yield - The increased deposition, in tons per year, of solid fragmental material into area streams due to increased soil erosion.

Semi-Primitive Motorized - Semi-Primitive Motorized areas also contain not less than 2,500 acres and are located within 3 miles of trails or primitive roads used by motor vehicles, but not closer than ½ mile from non-primitive roads (i.e. those that have been designed and constructed, rather than just developed over time by use). The setting may have some subtle human-caused modifications that may be noticed and may draw the attention of the observer passing through the area. Typically, these areas provide less solitude than semi-primitive nonmotorized areas because of easier access and noise from motorized use.

Semi-Primitive Non-motorized - Semi-Primitive Non-motorized areas are typically at least 2,500 acres in size and are at least 1/2 mile but not more than 3 miles from roads or trails with motorized use. The setting may have some subtle human-caused modifications that may be noticed and may draw the attention of the observer passing through the area.

Sensitive species - Those plant or animal species that are susceptible or vulnerable to activity impacts or habitat alterations and will be managed similar to threatened or endangered species. The Forest Service policy is to ensure that species would not be affected in such a manner as to have them listed or proposed for listing as threatened or endangered.

Sensitivity Levels – A measure of people’s concern for the scenic quality of the Forest. Sensitivity levels are developed for visitors viewing the Forest as a result of traveling by car, hiking, camping, fishing, or boating. Three levels of sensitivity are used 1 being most sensitive and 3 being least sensitive.

Species - A population or series of populations of organisms that are capable of interbreeding freely with each other but not with members of other species. .

Study Area - Area of analysis for proposed mineral withdrawal on the Helena and Lewis & Clark National Forest.

Talus (scree) - Fragments of rock and other soil material.

Threatened, Endangered and Sensitive Species (TES) - Any species, plant or animal, which is likely to become a threatened or endangered species within the foreseeable future throughout all or a significant portion of its range. The Secretary of the Interior in accordance with the 1973 Endangered Species Act identifies threatened species.

Total Dissolved Solids - TDS - Summation of anions and cations dissolved in water.

Traditional cultural properties (TCPs) - Properties that play a role in living or modern communities historically rooted beliefs, customs, and practices.

Unpatented mining claim - A geographic area of public lands in which an individual, by the act of valid location under the mining laws, has obtained a right to remove and extract minerals from the land, but where full title has not been acquired from the U.S. Government. The maximum size of a lode claim is 600 x 1500 feet (approximately 20 acres) and the maximum size of a placer claim is 20 acres.

Valid Existing Rights - Mining claims have valid existing rights if a discovery was made on the claim prior to the date of withdrawal from mineral entry. A mining claimant must make a discovery of a valuable mineral deposit within the limits of a mining claim as a prerequisite to a valid location. A discovery exists where minerals have been found on the claim that are of such a character that a person of ordinary prudence would be justified in further expenditure of his labor and means with a reasonable prospect of success in developing a valuable mine. This prudent person test has been refined to require a claimant to show that the mineral is marketable, that is, that it can be extracted, removed, and marketed at a profit.

Variety class - A particular level of visual variety or diversity of landscape character.

Vegetation types - Existing plant communities with distinguishing characteristics, typically dominated by one or two species, which are used to name the vegetation type.

Viability - The likelihood of continued existence in an area for some specified period of time.

Viewpoints - For analytical purposes, key-viewing locations used to determine the visibility of features or objects.

Viewer sensitivity - The degree or measure of viewer interest in the scenic qualities of a landscape. Viewer sensitivity is often closely associated with the level of visual expectation of the viewer.

Visibility - The level or measurement of the ability to see a feature from a particular view point or view points. Usually measured in distance called Standard Visual Range.

Visual quality - A qualitative term used to indicate the relative attractiveness of a visual resource.

Visual quality objectives (VQOs) - A desired level of scenic quality based on physical and sociological characteristics of an area. Refers to the degree of acceptable alteration of a characteristic landscape.

Visual Resource – The composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify a land unit and influence the visual appeal of the unit. Also commonly called “scenery resource”.

Watershed - The entire land area that contributes water to a particular drainage system or stream.

Wetland functions - Physical, chemical or biological processes or attributes of wetlands that are vital to the integrity of the wetland system.

Wetlands - Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas (33 CFR 328.3). Jurisdictional wetlands are based on the guidelines and criteria set forth in the Corps of Engineers Wetland Delineation Manual (Environmental Laboratories 1987).

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